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No. 11

September 14, 1918

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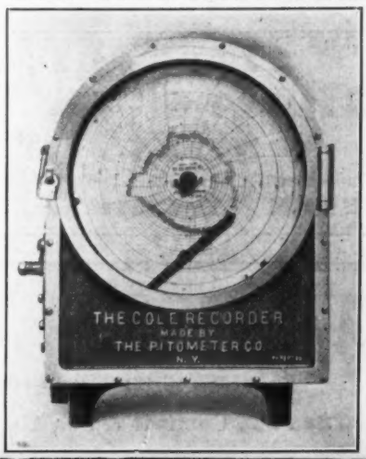

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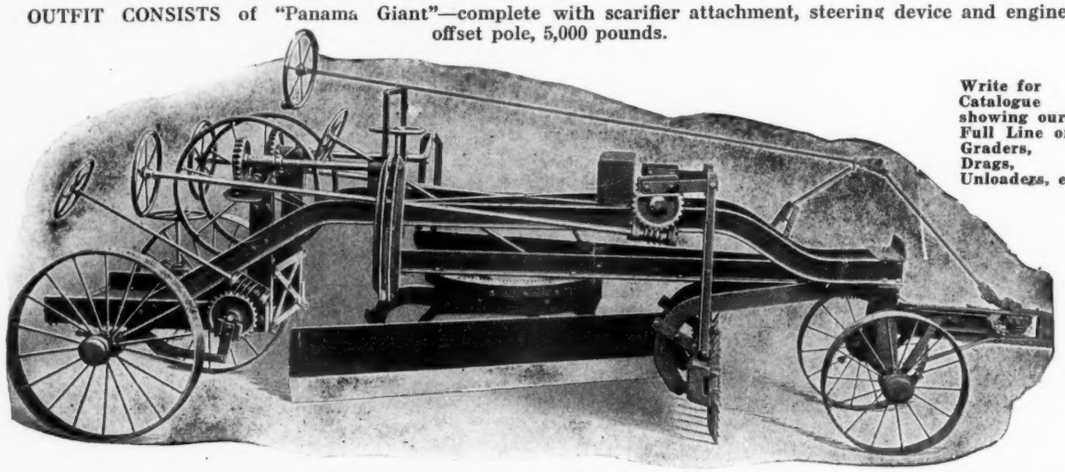

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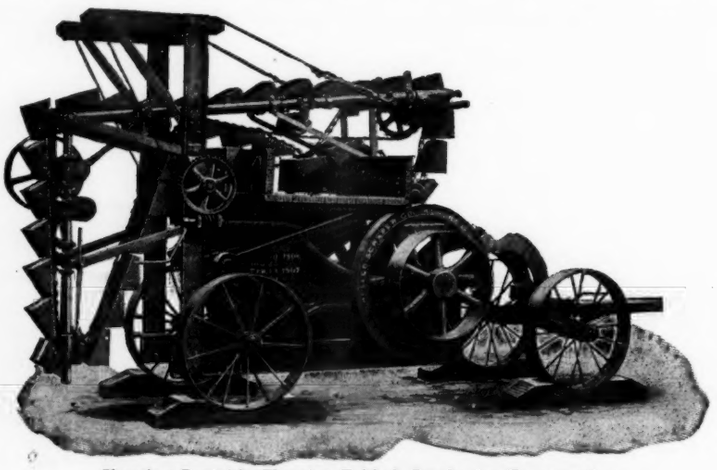

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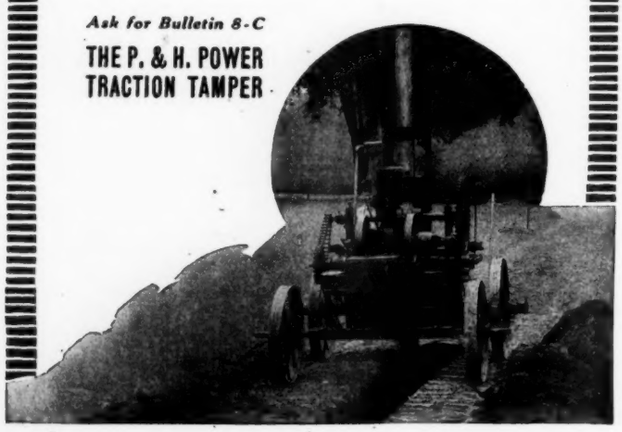

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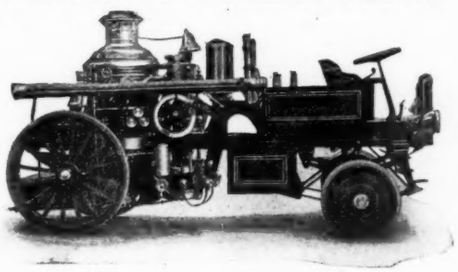

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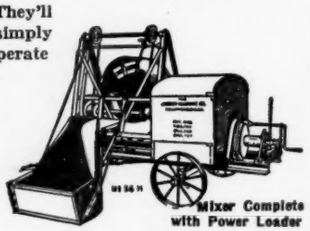

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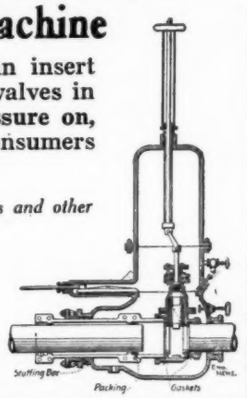

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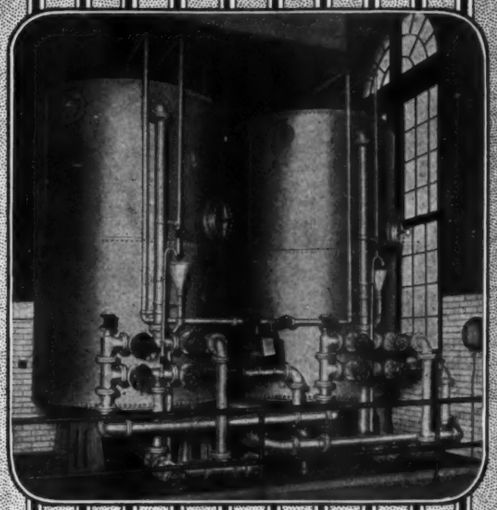

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Municipal Journal

Volume XLV. NEW YORK, SEPTEMBER 14, 1918 No. 11

CATCH-BASIN CLEANING IN CHICAGO

About Forty-Five Thousand Catch-Basins Cleaned Last Year—Cleaning Done by Hand and by Auto-Eductor—Itemized Costs of Cleaning—Deciding When Each Basin Should Be Cleaned.

The sewer system of Chicago comprises 2,467.8 miles of sewers, of which 750.3 miles are of brick and concrete construction and 1,717.5 miles are of vitrified pipe. Connected to the system are 119,457 catch basins. The sewers and catch-basins are cleaned by the Cleaning Division of the Bureau of Sewers, Department of Public Works. According to the report for 1917 of the superintendent of the Bureau of Sewers, Geo. E. McGrath, the work done by the Cleaning Division that year in the seven districts into which the city is divided was as follows: 6,755,100 feet of sewer flushed at a cost of $40,596.60; 542,400 feet of sewer scraped at a cost of $49,948.79; 41,231 catch-basin cleanings by hand at a cost of $116,500.55; 1,729 catch-basin cleanings by auto-eductor at a cost of $1,552.31; and opening inlets, answering complaints, etc., at a cost of $57,069.14; to which costs are added $3,697.15 for supplies, materials, etc.

The costs given include a proportional part of salaries of district foremen and assistant foremen. Of the total cost, $185,907.29 was for salaries and wages and $79,760.50 for teams, horses and carts. In the case of the auto-eductor the amount given was for wages of crew, to which should be added $475.51 for supplies and repairs, interest at 4 per cent (for the 5 months after it went into operation) $116.66, and depreciation at 10 cts. per mile, $229.30. This gives a total cost of $2,373.78, giving an average per basin cleaning of $1.375 and per cubic yard removed of $0.81; as compared with a cost of $2.83 per cleaning by hand. In cleaning the 1,726 basins and removing 2,929 cubic yards of material the auto-eductor traveled 2,293 miles and hauled 490 loads to the dump. Aside from the above statistics Mr. McGrath's annual report on sewer and catch-basin cleaning was confined to a description of the work of the auto-eductor, which is as follows:

On the 1st of August the Bureau of Sewers placed into service in the First Cleaning District a catch-basin cleaning device known as the Otterson Eductor. This is, in general, a Kelly-Springfield 5-ton motor-driven vehicle, on which is mounted a centrifugal pump. The vehicle and the pump are driven by the same motor. The cleaning is done by the use of a jet in the discharge pipe of the pump, a flexible loop of the discharge pipe containing the jet being lowered into the basin. By this method the solids from the basin do not pass through the pump itself. The wastes are discharged into a box mounted on the Eductor, the box being of sufficient size to contain the material taken from three or four basins.

Water for the pump is drawn from the wagon box, the solids in the box being retained by the use of baffles. Thus a continuous circulation is maintained from box to pump and from pump to box until the capacity of the box for solids is reached, at which time the machine is run to a dump and unloaded, the unloading being accomplished by a tipping device operated by the vehicle motor.

The success of the machine may be best given by a statement of costs of hand cleaning and machine cleaning in the First Cleaning District, the machine-cleaning covering a period of five months. These are as follows:

Costs per catch-basin cleaning in the First Cleaning District:

By hand	$3.37
By Auto Eductor	1.37

In addition to being approximately 60 per cent cheaper it is a more sanitary and cleanly method.

At present the Bureau of Sewers has seven auto-eductors in service. The first was placed in commission in July as an experiment, and given a thorough test, following which six more were bought and placed in service in April of this year. The result of their operation is such that Mr. McGrath has recommended to the city council the purchase of four more. Those in use save the city, he reports, an average of $6,000 a month, which would otherwise be expended for hand labor. Some of the details of their operation given by him are as follows:

From August 1, 1917, to August 1, 1918, the first machine working all of the 12 months, the other six operating but three months, the period of one year broken by a vacation totaling 32 days, the number of catch-basins cleaned was 10,847 and the number of cubic yards of dirt removed 13,064. With full gangs of men during the same period 21,601 catch-basins were cleaned and 25,473 cubic yards of refuse removed by hand. To clean a catch-basin by eductor cost $1.51; by hand $2.98. To remove each cubic yard of dirt costs by eductor $1.26; by hand $2.53. In the eductor costs are included all overhead charges—gasoline, oil, grease, repairs, one-fifth of the maintenance charge in the sewer district to which each eductor is detailed and 10 cents per mile for depreciation.

Catch Basins Cleaned by Eductors, June, 1918, Seven Districts.

Dist	No. C. B.'s Cleaned.	No. Yds. Dirt.	Salaries and Wages.	Supplies Gas, Oil, etc.	Miles Run.
*1	308	384	$430 90	$54.74	308
2	390	427	464.90	57.80	420
†3	309	304	372.90	49.58	346
4	482	485	464.19	66.44	397
5	470	504	471.80	63.92	453
6	471	533	471.80	66.64	556
‡7	554	536	458.10	70.26	515
	2,984	3,173	$3,134.59	$429.38	2,993

* Off 6 days for repair.
† Off 8 days for repair.
‡ Dumping facilities enabled this machine to keep at cleaning work more constantly than the others.

Number of catch basins cleaned	2,984	
Number of cubic yards dirt removed	3,173	
Cost of labor, salaries and wages		$3,134.59
Cost of gas, grease, oil, etc		429.38
Miles run	2,993	
Depreciation, 10c per mile		299.30
Cost of repairs of 7 Eductors for month of June		269.79
Total cost of operation		$4,133.06

Cost of cleaning per basin.....	$1.39
Cost per cubic yd. dirt removed.....	1.30

Catch Basins Cleaned by Hand in June, 1918.

No. catch basins cleaned.....	479
No. cubic yd. dirt removed.....	544
Average cost per catch basin.....	$3.48
Average cost per cubic yard.....	3.06

DEPARTMENT OF PUBLIC WORKS—BUREAU OF SEWERS
REPORT OF ASSISTANT FOREMAN
CLEANING DIVISION

DISTRICT NO. _____ CHICAGO, _____ 191_

Condition Basins Cleaned Previous Day	LOCATION OF WORK	Name of Sub-Foreman Number of Men and Teams	Hours	Catch Basins Cleaned	Yards Taken From Each	Loads Hauled	Catch Basins Examined	Yards in Each	MAIN SEWERS EXAMINED	CONDITION OF MAINS	TIME OF ARRIVAL	TIME OF LEAVING

REMARKS:—Excessive cost or other occurrences out of the ordinary must be explained. P W R 12 5M 6-18 3138

Approved: _____ Foreman of District Signed _____ Assistant Foreman

FORM USED BY ASSISTANT FOREMAN OF CLEANING DIVISION.

Each machine cleans an average of 365 basins in a month. In this record is included time lost in vacations for the crews and for repairs. The department of sewers shows that by hand labor (gangs of three men each working eight hours a day) seven catch-basins are cleaned daily or at the rate of 168 a month. It will thus be seen that an eductor can do more than twice the work of a hand crew at about half the cost.

It is necessary that at least 45,000 catch-basins be cleaned every year. The Bureau of Sewers expects to clean 31,000 of these at the rate of about 4,500 to each machine, and about 15,000 basins by hand.

The average mileage of each eductor is 450 a month, traveling on streets which as a rule are straight, level and paved. The unusually great distance from catch-basins to dumps operates against a more favorable showing by the eductors and constitutes what is termed an insoluble problem. The average haul is two to three miles for each load. The average number of loads is three to four a day, five to six cubic yards of dirt composing a load. Carts drawn by horses or mules haul, on an average, two to three loads of two cubic yards each a day.

A test was held recently to learn the least time required to empty a standard basin, 10 feet deep and four feet in diameter, and it was found to be exactly six minutes. Motion picture cameras photographed the operation. Similar work by hand would have taken 2½ hours. From careful study of the operation of these machines Mr. McGrath concluded that one eductor crew can do the work of almost 2½ hand crews.

Superintendent McGrath has recently increased the size of eductor crew from two laborers and a chauffeur to three laborers and a chauffeur, believing that this will increase the efficiency of the machine, since two laborers are required to work so hard that their effectiveness is lessened by fatigue, and additional work done by the machine will more than offset the wages of the additional laborer. Also instead of each chauffeur drawing gasoline for the eductor whenever he desires without check on the amount, he now issues books of coupons, each book carrying enough for $10 worth of gasoline, from which coupons are taken covering the value of the gasoline put into the tank, and thus a record is kept of each machine and it is calculated that waste is eliminated that would amount to at least $6,000 a year.

The average pay of each chauffeur is $125 a month, that of the man in charge of the eductor is $4.60 a day, and the two laborers receive $3.80 a day.

The area of Chicago is about 200 square miles divided into seven districts, in each of which an eductor was placed, each district in charge of a foreman. Three police stations, recently abandoned, serve as barns for the apparatus. Each foreman has an assistant who patrols his territory and with a rod determines the depth of dirt in each catch-basin. These data, reported by him to his foreman, indicate where cleaning is needed. It is the duty of the assistant foreman to see that every detail in his reports is observed. His reports show, also, how much time is required to clean the basins in his district.

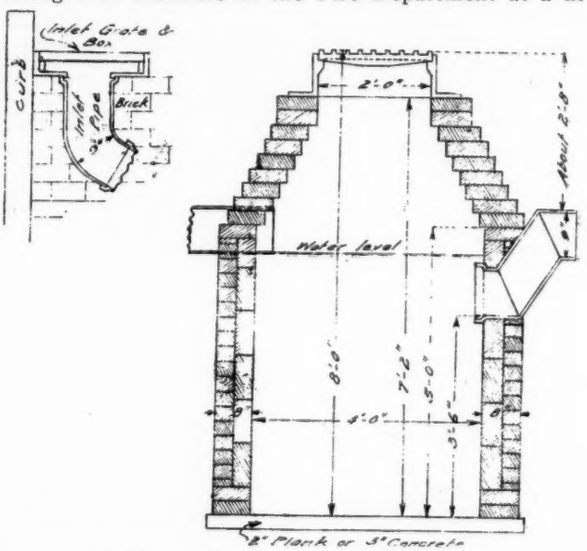
In each district there are, on an average, 17,000 catchbasins. The frequency of cleaning these depends on their location, being greatest where traffic is heaviest or where street improvements are lacking. In the downtown districts, where traffic is congested, the basins are cleaned at least every 30 days. This is done at night. Outlying basins require cleaning every six months or twelve months. Many are never cleaned, apparently, since the number of cleanings per year is only 36 per cent of the total number of basins.

When hand cleaning is employed, telescopic shovels are used for bringing the dirt to the street surface, from which it is shoveled into wagons of two cubic yards capacity, each drawn by two horses, in which it is taken to the dumps. Where the catch-basins are unusually deep, buckets are used for removing the dirt.

The standard type of catch-basin is shown by the accompanying illustration. Superintendent McGrath is changing this in a number of locations by doing away with the inlet and connection to the basin, instead using perforated lids directly over the basin, as is the practice in most other cities. Not only is this cheaper to construct, but it is found that the old type of inlet and pipe are obstructed by leaves, dirt and twigs, and in winter by ice and slush.

USE OF PULMOTORS IN SEATTLE.

The Fire Department of Seattle during 1917 used pulmotors (the Draeger rescue apparatus) on three occasions, one for resuscitating a boy who had committed suicide by gas (where it was unsuccessful), one in reviving four members of the Fire Department at a fire,



STANDARD PLAN FOR CATCH-BASIN.

and the third where an employee of the gas company had been overcome by gas. Smoke helmets were used on seven occasions, six of these for shutting off ammonia valves, and once in a fire on a steamship. In one of these instances two men worked forty-five minutes with the smoke protectors in connection with closing ammonia valves, but in most cases they were used only from ten to twenty minutes.

WATER WORKS OPERATION.

Insulating Pipe Surfaces—Location of Mains—Electric Screens—Insulating Joints—Pipe Drainage —Railway Return Circuits.

Note: The following is condensed from reports on the subject by the U. S. Bureau of Standards, probably the most reliable source of information on the subject. References are made to the hydraulic parallel given in last week's issue.

Many methods have been proposed and tried for reducing or eliminating damage to pipe systems from stray currents from street railways. The majority of them have been found to be either of no value or such limited application that they are of no general importance, while some are positively detrimental. Of methods applied to the pipe systems themselves none are suitable for general use as a primary means of preventing electrolysis troubles. Methods involving chemical protection, cement coatings, cathodic protection and conducting coatings should be regarded as essentially worthless in their present state of development. Surface insulation of pipes by means of paints or dips is not much more reliable, but insulation by putting the pipes in troughs or conduits filled with pitch may be used in special cases where the expense would be justified. The practice of placing all pipes as far as possible from railway tracks affords a certain measure of protection of which advantage should always be taken wherever practicable in laying new lines or relaying old ones, and the use of electric screens is often a valuable expedient in taking care of acute local cases of trouble in existing mains. These methods, with the exception of that relating to the proper location of pipes in new work, are suited only to special conditions, however, and are not usually to be considered as important factors in any general plan for electrolysis mitigation. The chief reliance for mitigation should be placed in measures applied to the railway for reducing stray currents to the lowest practicable minimum.

A.—*Painting* or otherwise insulating the surface of pipes as by the use of treated papers and textiles has been used in some instances (compare with plan 1), but it is doubtful whether there has been a case in which it has been definitely proved that insulating paints have effectively protected pipes from electrolysis for any considerable period of time, while there are many instances where they have failed utterly and their presence has actually done harm. The materials used for this purpose may be classified as paints or other compounds applied at ordinary temperatures; dips or compounds melted at a high temperature in which the iron is immersed; wrappings of alternate layers of compounds or fabric; fibre conduit with or without pitch filling; enamels, and cement or concrete. It may be said of coatings generally that they are apt to fail in spots allowing moisture to enter through cracks or pores and thus conduct the current to the pipe. Once water has penetrated to the material, a slight flow of the electric current takes place which results in a small amount of electrolysis, and this invariably produces more or less gas which, being confined, soon develops sufficient pressure to rupture the coating. Most or all paints not only fail from this cause, but the currents themselves have much to do with the destruction of the coatings. The bureau of standards has tested about forty different kinds of paints and not a single one withstood the action of the very moderate test voltage of four volts for any considerable length of time. Where these currents break down, the discharge of the current from the pipes is concentrated at these points and the pitting is likely to be more serious than if no paint or coating were used and the discharge of the current were general over a large area. If such coatings, however, are applied at points where the pipe is always negative to the ground, they may be of considerable temporary value in reducing the amount of current taken up by the pipe and in that

PUMPING OUT A CHICAGO CATCH-BASIN.

way indirectly reduce damage in the positive areas or those where the current leaves the pipe.

Cement coating for pipes has been used for a number of years, but as no coating examined was found to be entirely non-porous, it is believed that they form no permanent protection against electrolysis.

Conducting coatings would protect pipes if it were possible to provide a continuous coating which would not corrode under the discharge of electric currents. Such coatings as have been applied up to the present time have not only failed to protect the pipes, but have been harmful in their effects because of a tendency to increase the self-corrosion or galvanic action in the pipe.

B.—*Cathodic* is the name given to the methods devised for maintaining the pipes negative to the earth at all points of the system. (Compare with plan 2.) If this condition could be secured, electrolysis could not occur. A number of patented methods have been based upon this idea, but the Bureau of Standards considers all of them inexpedient and worthless.

C.—*Location* of pipes with respect to tracks has a very important bearing on the danger of electrolysis. (Compare with plan 3.) In general, the further the pipes are from the tracks, the less current they will pick up and hence the less the total danger. A more important matter is the distribution of the discharge, it being desirable as far as practicable to distribute the discharge over a large area. If the pipe in the positive area be brought near to the tracks at one point (as by crossing immediately under them), the tendency is to concentrate the discharge at that point and thereby cause rapid local destruction. Location of pipes is therefore more important within the positive area than outside of it. It is believed that a great deal can be accomplished in the way of reducing electrolysis by keeping pipe lines as far as practicable from street railway tracks.

D.—*Electric screens* is the name given to masses of metal electrically connected to the pipe at the point at which the current is discharged. (Compare with plan 4.) The current is then carried from the pipe to the screen by way of a metallic path, generally a cable, and from the screen is discharged into the earth, the corrosion taking place on the screen instead of on the pipe. In order to be effective, the screen must be placed on the side of the pipe toward which it tends to discharge current or, if current is discharged on all sides, the screen must take the form of a larger pipe enclosing the pipe which is to be protected. This method is not adapted for extensive use throughout the pipe system, but it may be useful in special cases for relieving severe cases of corrosion in very restricted areas, as where the pipe passes over or very near a street railway line or another pipe system which is strongly negative to the pipe to be protected.

E.—*Insulating joints* as an auxiliary measure may often be used to advantage to supplement measures applied to reduce voltage drops in tracks to reasonably low values. (Compare with plan 5.) If properly installed and placed with sufficient frequency, they can be made very effective in minimizing electrolysis troubles. The higher the potential gradient* in the different parts of the system the more frequently the insulating joints must be used. In most cases it would not be necessary to make every joint insulating, one-third or one-fourth of the joints being usually sufficient even under severe voltage conditions, while in many parts of the system a much smaller percentage would suffice. Resistance joints should not be confined to the positive area, but should be distributed along the negative and neutral areas also. Lines which run near by or cross under street railway tracks are generally most in need of resistance joints. If the current which tends to follow a pipe line has sufficient voltage, it will pass from one pipe to another around the joint by some other road, generally through the ground. In such a case the insulating joint may be actually injurious, since the current in leaving the positive pipe would produce electrolytic corrosion. Consequently the voltage drop at joints in the pipes must be kept sufficiently low, by an adequate number of insulating joints. Careful observation of joints under average conditions for a considerable period, together with experiments, indicate that in cast iron mains a drop across the joint of from 0.1 to 0.4 volt can usually be regarded as safe, while in wrought iron pipes the voltage should not be allowed to exceed about one-third of these values. The lower limit applies to pipes located in low, wet places and to joints having a short leakage path between the sections of the pipe, while the upper limit applies to pipes in comparatively dry soils and joints having a long leakage path.

Joints designed to be insulating may prove not to be so, especially if they have been in service for a considerable length of time. A little carelessness in making the joint may permit the two ends to make metallic contact, in which case, of course, there is no insulation. This is particularly apt to occur in making joints where cement or leadite is substituted for lead, but can easily be guarded against with a little care. But even when made very carefully, such joints will often show surprisingly low resistances after having been in service for some time. Leadite joints when new have ample resistance, but this appears to decrease rapidly with age. Lead joints in cast iron mains are frequently found to have a resistance equal to that of several hundred feet of pipe, and it is due largely to this high joint resistance and to some extent to the higher specific resistance of cast iron than that of wrought iron or steel mains that cast iron mains usually carry less current under similar conditions than do the others. Experience has shown, however, that the resistance of lead joints is not sufficient to reduce the current to a safe value. In ordinary wrought iron or steel pipes with screwed or riveted joints, the resistance of the joints is usually small in comparison with that of the pipes and when such pipes are laid where there is an appreciable potential gradient in the direction of the pipe, current of considerable magnitude will usually be carried by the pipe. Measurements of current in gas and water mains show that cement joints, even when installed with no attempt to keep the pipe ends apart, materially reduce the current collected by the mains.

When precautions have been taken so that potential gradient is reduced to a comparativley low value, such as one volt per thousand feet or less, insulating joints may well be applied for the purpose of limiting such residual electrolysis as might otherwise occur if the system were not so protected. With potential gradients as low as this, a comparatively small number of insulating joints—not exceeding 5 or 10 per cent—would be sufficient to give practically complete protection to the pipes.

One of the problems encountered in attempting to protect a pipe system by the use of resistance joints is the effect of other pipe systems in the same territory not so protected. Gas and water systems, for instance, are often brought into metallic contact with each other in many places, and this greatly increases the difficulty of protecting either system alone by the use of resistance joints. This difficulty could be largely avoided by inserting an insulating joint in the service pipe inside of the buildings in which metallic connection with the other system is

* A potential gradient is the rate of change of potential along a conductor. It is generally expressed in terms of volts per thousand feet.

made, but this would usually be expensive and there are other complications not so easily dealt with.

F.—*Pipe drainage* is the removal of current from the pipe through conductors instead of permitting it to discharge directly into the earth. (Compare with plan 6). The conductors may take the form either of bonds connected directly between the pipes and tracks wherever the pipes are found positive to the tracks, or of special feeders running directly from the negative buss bar out to various points on the pipe system. The joints are ordinarily short, heavy cables with one end connected to the pipe and the other to the rail.

Pipe drainage does not decrease the amount of stray currents flowing through the pipe and in fact generally increases it, and is designed merely to minimize the immediate destructive effects of such currents. In St. Louis, Missouri, a test of drained and undrained pipes showed 844 amperes of total current on the drained pipes and 273 on those undrained. These tests also showed potential differences between adjacent fire plugs 3 to 4½ times as great when the negative feeder system was insulated as when it was not insulated.

Drainage of lead cables is less objectionable under most circumstances than drainage of pipes, since the cables are usually continuous conductors without high resistance joints at which trouble may occur. Moreover, when cables are laid in conduits that are kept free from standing water, they are in much less intimate contact with the earth than are pipe systems, and consequently drainage does not induce such heavy current flow as is caused in pipe systems.

The reports of the Bureau of Standards give ten objections to pipe drainage which are as follows: 1. Pipe drainage is not a permanent palliative but requires constant watching and changing whenever there is a marked change in either the distribution of the pipes to which the cables are connected or in the track network or the distribution of load on the track. 2. It necessarily increases the amount of current carried by the pipe which is accompanied by a correspondingly increased danger of trouble at joints or in unlooked for places. 3. In all cast iron pipe systems using lead joints it will be found that the lead joints not infrequently develop high resistances which may reach values equivalent to that of hundreds or thousands of feet of pipe and the drop at these joints will be so great that leakage current around the joint will be sufficient to cause rapid destruction of the pipe. 4. Where cement or other insulating joints are used, particularly in cast iron gas mains, frequently all of the current will leak around the joint and do great damage unless the current is kept extremely small. 5. The application of drainage to any one system of underground structure lowers its potential with respect to neighboring metallic structures, thereby tending to injure the latter, and the greater the amount of current drained from one system, the greater will be the damage to the other structures. 6. Increasing the flow of current in pipes by drainage increases the danger of arcing at points where the pipe line or its connections are opened for any reason, or where different pipes or cables at different potentials make momentary contact. To guard against this danger, it is usually necessary to bond across the proposed break in any gas pipe to which drainage is applied. Failure to provide such a bond or the accidental opening of it while the continuity of the pipe is interrupted is likely to ignite escaping gas with the possible result of loss to life and property. 7. There is also danger of the formation of arcs by transient contact between different pipes or cables entering buildings, which is greatly increased by drainage. Manhole explosions probably are frequently caused by transient arcs caused by creeping of cables in conduits. 8. Heavy current flow on pipes may cause overheating of service pipes and their connections. There have been cases in which metallic connections between gas and water pipes in gas water heaters have been heated red hot by excessive current flow therein, and lead service pipes have been melted by excessive current flow caused by drainage. 9. The increased current flow tends to produce an excessive amount of alkali at the surface of the negative electrode imbedded in the earth. This occurs to a greater extent in some soils than in others, being greatest where the soil contains large amounts of alkali salts. This concentration of alkali at the negative terminal will have no detrimental effect on iron pipes, but may cause considerable soil corrosion in the case of lead service pipes and lead cables. 10. Pipe drainage systems tend only to relieve the symptoms rather than to remove the cause of the trouble, and pipe drainage is therefore a palliative rather than a remedy.

RAILWAY NEGATIVE RETURN.

The most logical method of mitigating electrolysis would appear to be to attack the problem at the source of the evil and prevent or diminish the leakage of currents from the railway return conductors into the earth.

If alternating current were used, the amount of electrolysis that would occur would in most cases be not more than one per cent of what it is with direct current. But the objections to substituting alternating current for direct current in systems already installed in large cities are so obvious and so serious that this remedy cannot be considered.

The double-trolley system of electric traction used in Cincinnati, and the corresponding underground conduit systems used in Washington and in Manhattan Borough, New York, eliminate almost completely the danger of electrolysis, the small leakage which occurs being of no practical consequence.

Practically all street railway systems in this country are operated with positive trolleys. Under such conditions the stray current is taken up by the pipes over a relatively large area and discharged within a comparatively small area near the power house. The current density within the small positive area will be much greater on the average than in the much larger negative area. If the polarity of the trolley were reversed, the positive and negative areas would be interchanged without appreciably affecting the intensity of the current and we would have a low average density of current discharge from the pipes through a much larger area. The total amount of corrosion would not be materially affected, but its distribution over the larger area would tend to reduce the intensity of damage at any particular point and the average life of the pipes would be increased, although a greater number would be affected. While this postpones the time when serious trouble will develop, on the other hand, it distributes such trouble over a larger area, and most engineers would prefer to have the trouble localized where it can be more carefully watched and more effectively controlled. Since, moreover, this reversal of trolley polarity would generally impose serious hardship on cable-owning companies which have already installed a drainage system for protecting their cables, this method is not recommended.

Where there is only a single substation, a reversal of polarity once in twenty-four hours would be entirely practicable and would undoubtedly be decidedly beneficial. Where, however, several substations are being operated in parallel, it does not seem that the benefits obtained would justify the complication in operating conditions that would be caused by such periodic reversal.

In the socalled neutral zone of street railway networks the pipes are continually reversing in polarity and the damage here is much less than would be expected from a consideration of the arithmetical average of the current discharged from the pipes into the earth. Where pipes are alternatively positive and negative with periods not exceeding fifteen minutes, the algebraic sum of the currents discharged approximates a correct index to the total damage that will result. This applies to a frequency of reversal not exceeding one or two weeks in the case of iron, and not exceedingly one to seven days in the case of lead. The greater the frequency of reversal the less the damage.

The fundamental conditions to be realized in order to reduce the leakage of stray currents into the earth is the maintenance of minimum differences of potential between the different part of the grounded track network. (See plan 7.) In addition to this, in so far as the roadbed is given high resistance, leakage current is prevented. For interurban roads, wood ties and good well-drained ballast will do much toward preventing electrolysis. The specific resistance of dry rock ballast is very high, the conductivity of a rock ballast roadbed being due largely to that of the filaments of moisture and dirt on the surface of the stones. In cities insulation is more difficult. Moist concrete has a specific resistance only a little higher than clean earth.

A properly drained road bed is a very effective aid in reducing the leakage of stray currents from the rails, since the conductance of the leakage path is largely dependent upon the amount of moisture contained in the road bed. (Compare with plan 11.) In fact the Bureau of Standards has found long lines of track where leakage from the rails had been almost entirely eliminated by providing a dry road bed.

RAIL BONDING.

Engineers recognize the futility of trying to maintain a proper state of track conductivity by merely bridging the joints with short copper bonds. In most of the larger and better systems these methods of shunting the joints are used chiefly as secondary expedients, if used at all. The tendency now is to make the joint itself electrically continuous rather than to shunt around it. All special work should be shunted by copper cables capable of carrying all of the current passing over the tracks at that point.

Cross bonding between the rails is much resorted to as a precaution against trouble arising from bad joints, and if such bonds are properly installed and maintained at intervals not exceeding from 200 to 500 feet and the rail joints are fairly well maintained, the deleterious effects of occasional bad joints are almost entirely eliminated.

Cross bonding of the two rails of a single track would be unnecessary if all bonds were maintained in perfect condition, but as this is never the case, cross bonding is very desirable. Bonding between tracks on double track lines is especially desirable, as it not only serves to shunt the current around high-resistance joints, but also equalizes the load between tracks when these are not uniformly loaded.

The important requirement of a rail bond is that it makes good electrical contact with the rail, which will remain good for a period of years while subjected to mechanical vibrations of traffic, changes of temperature, the action of soil and moisture, and mechanical injuries from workmen and vehicles. The durability of the bond itself depends upon its ability to withstand the bending and vibration incident to expansion and contraction of rails and deflection of rail-joints under traffic, and also upon its ability to resist electrolithic and soil corrosion. It should be of such nature that it can be safely and quickly installed while traffic is being continued. Under ordinary conditions, the resistance of a bond within moderate limits is subordinate to its other qualities. The theft of rail bonds, because of the value of the copper, is a serious problem, especially in surburban districts.

Riveting or bolting solid iron or copper wires to the rail is no longer practiced, but soldered joints are those most commonly used. Instead of these, some of the more modern installations have employed compressed bonds, brazed or welded bonds, and cast-welded, thermit-welded, electrically-welded or arc-welded joints. While welded joints are being used more than ever, there is a growing tendency to adopt improved mechanical joints, these being bolted and riveted joints designed to eliminate the effects of expansion and contraction.

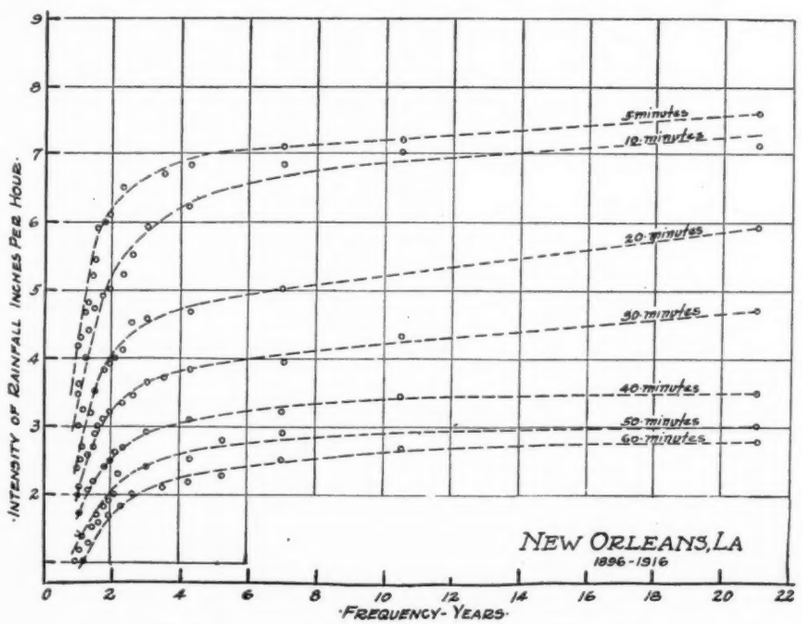
Where two or more railway systems operate in the same territory, it is of the greatest importance that the tracks be electrically connected at all intersections. Where tracks parallel each other for half a mile or more, or where they are only a block or so apart, it is important that occasional cross ties between the lines be installed to prevent wide fluctuations of voltage between them.

(To be continued)

FREQUENCY OF EXCESSIVE RAINFALLS

Data Compiled by U. S. Housing Corporation from Records of the Weather Bureau Showing Average Frequency of Rainfalls at Various High Rates.

The United States Housing Corporation, in connection with the designing of storm-water sewerage systems for the numerous housing projects which they are rapidly getting under way, has prepared a series of rainfall curves which its engineers believe to be different from



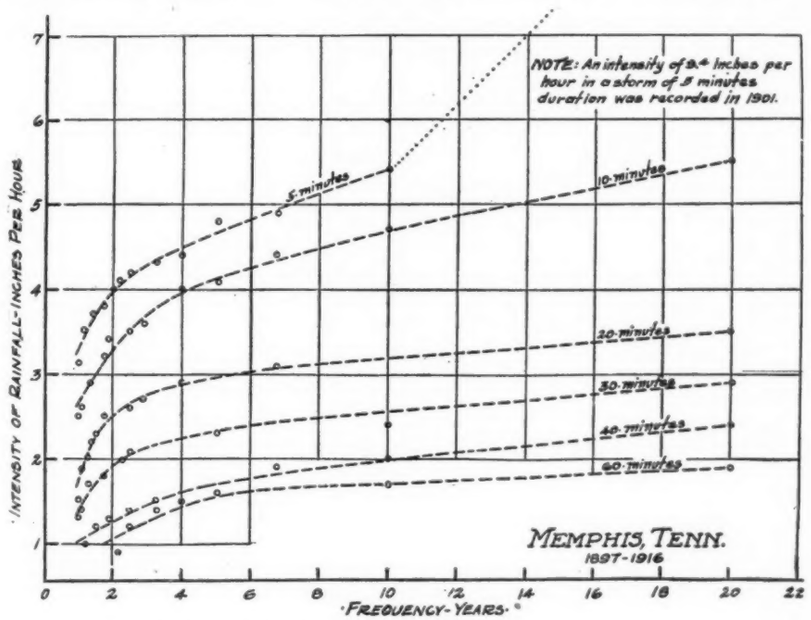
FROM RAINFALL DATA AT NEW ORLEANS, 1896 TO 1916.

any heretofore published. Through the courtesy of John W. Alvord, the chief engineer of the Housing Corporation, and F. E. Turneaure, utility engineer under whose direction the diagrams were prepared by E. P. Burke of the engineering staff, we are able to show a few of the 23 curves that have been prepared as typical of the several sections of the country where the housing projects of the Government are located.

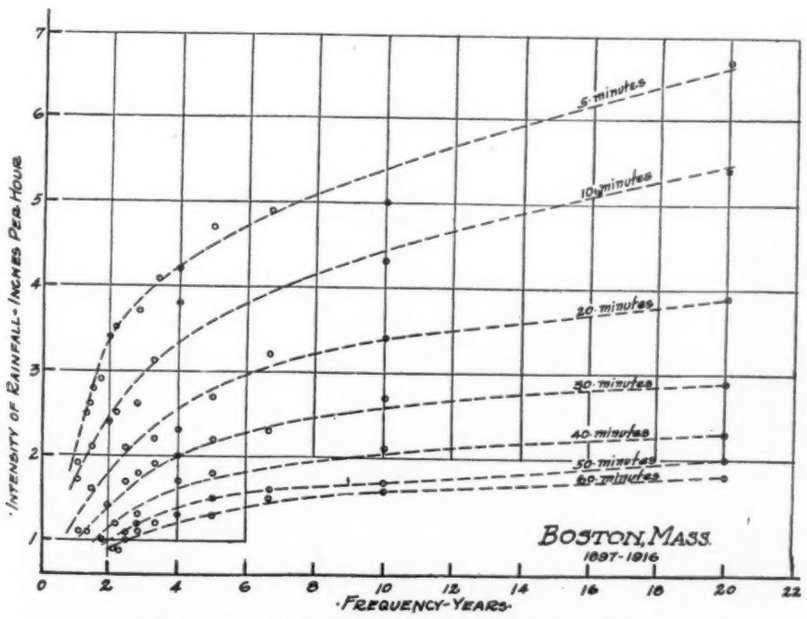
These diagrams were prepared from data of excessive rainfall given in the annual reports of the U. S. Weather Bureau, in most cases beginning about 1896. These data, given in tabular form, contain records from self-registering rain gauges of all storms in which the rate of rainfall equalled or exceeded 0.75 inch per hour.

These data were plotted with ordinates representing intensities and abscissas representing average period in years between successive storms of the intensity and duration in question, the durations being indicated on the diagram by the dotted curves. Thus, in the diagram for Boston the point having an ordinate of two and abscissa of four indicates that an intensity of two inches per hour lasting for thirty minutes has been experienced on the average of once in four years during the period covered by the records—that is, five such storms have occurred during a twenty-year period. During this same period two of these storms equalled or exceeded 2.7 inches per hour and one storm had an intensity of about 2.9 per hour. The durations for which data were plotted are those of 5, 10, 20, 30, 40, 50 and 60 minutes. Curves have been drawn as shown which represent fairly well average values.

It is believed that these diagrams will be found very useful by the engineers of the Housing Corporation, and also by other engineers throughout the country, in designing storm sewers. They give not only the intensity of rainfalls for various periods of time, but also the probable frequency and extent to which sewers designed for a given capacity are likely to be overtaxed. It is of course well recognized by the engineers that in only exceptional cases would it be practicable or economical to design storm sewers with a capacity ample for removing the maximum run-off of rain water which is likely ever to occur on their drainage areas. As an illustration, if the drainage area of a given sewer at Boston is of such size and shape that a twenty-minute storm will decide the capacity of the sewer, then the diagram will show that an intensity of 2.5 inches per hour can be expected about once in four years, and if the system is being designed on the basis of providing for the maximum storms of that frequency, then this amount of rainfall may be used; but it appears that a rainfall with an intensity of 3.4 inches per hour may be expected about once in ten years.

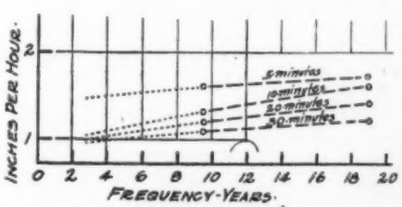


FROM RAINFALL DATA AT MEMPHIS, 1897 TO 1916.



FROM RAINFALL DATA AT BOSTON, 1897 TO 1916.

Of the 23 diagrams we are reproducing four, which are perhaps extreme, most of the others lying between them. It will be noticed how much flatter are the curves for Boston than those for New Orleans. But it will also be noticed that the curves of Memphis, Tenn., approximate in shape much more nearly to those for Boston than they do those of New Orleans, indicating that the difference between the Boston and New Orleans rainfall frequency characteristics is due only to a small degree to difference in latitude. The small diagram for Seattle, although only a few data were available for plotting it, shows how very different the rainfall charac-



SEATTLE, WASH., DATA.

teristics of the North Pacific coast are from those of the North Atlantic or the Gulf.

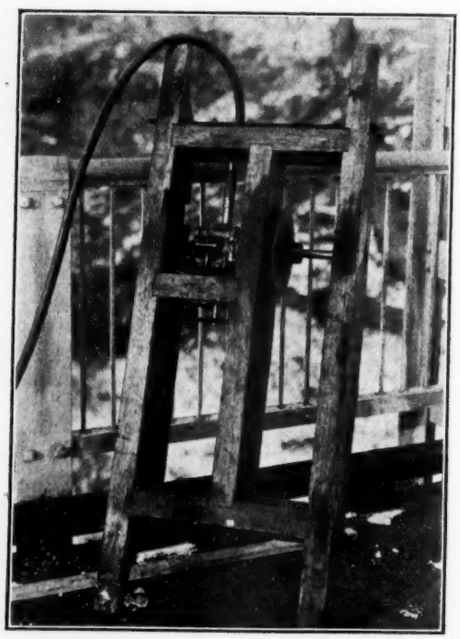
In sending these, Prof. Turneaure writes: "It is interesting to note that the characteristics of storms for short periods of time such as represented in these diagrams do not differ greatly among all the stations represented with the exception of the two on the Pacific coast. The differences are apparently much less than occur either in the annual rainfall or the total precipitation of excessive rainfalls. In fact, the entire set of curves, with the exception of those representing the two stations on the Pacific coast, could fairly be represented by two or three sets of diagrams. A study of the data from this standpoint should be made, but it was thought best to send out the complete information in the present form in order that it might be available promptly."

The cities whose records are represented by the 23 curves are as follows: Boston, Mass., Albany, N. Y., New York, N. Y., Philadelphia, Pa., Washington, D. C., Norfolk, Va., Savannah, Ga., Atlanta, Ga., Montgomery, Ala., New Orleans, La., Knoxville, Tenn., Memphis, Tenn., Louisville, Ky., Pittsburgh, Pa., Buffalo, N. Y., Detroit, Mich, Chicago, Ill., Duluth, Minn., Saint Paul, Minn., Saint Louis, Mo., Kansas City, Mo., Seattle, Wash., San Francisco, Cal.

A NOVEL PORTABLE PNEUMATIC SAW.

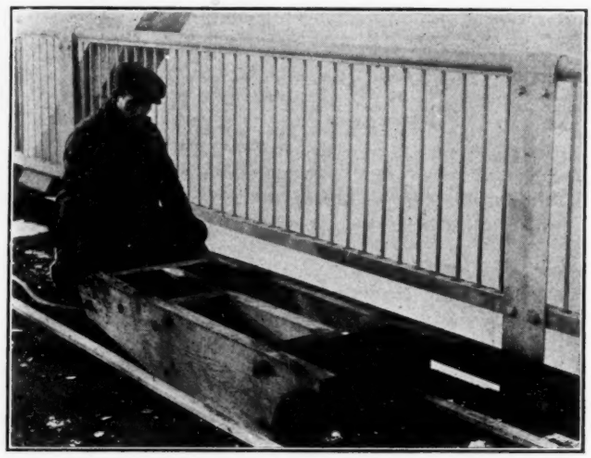
By FRANK C. PERKINS.

The accompanying illustrations show a portable saw improvised from a pneumatic drill at Hartford, Conn., for use by the State Highway Commission. By means of this device, instead of removing the guard rail and taking up the entire planking of a bridge 1,800 ft. long, it was possible to cut through the first layer of flooring, making it easy to tear up the planking whose replacement was desired without disturbing the remaining part that could still be utilized.



PNEUMATIC FLOOR SAW IN CRADLE.

This equipment consists of a circular saw, driven by a pneumatic drill, mounted in an oak cradle, which was chamfered at one end. In this way the depth of cut could be regulated by rocking the frame, which was easy, as the weight of the operator was ample. The air



PNEUMATIC FLOOR SAW IN USE.

was supplied from a portable gasoline compressor which was being used for some drilling and riveting on the steel work of the same bridge. In using the rig, lagging was tacked to the bridge flooring in advance to serve as a guide and allow the operator to give his entire attention to the working of the frame.

INDUSTRIAL ZONING.*

Suggestions for Preparing Zoning Ordinances and Division of Cities into Zones—Classification the Vital Feature—Industrial Districts.

BY HERBERT S. SWAN.†

There seems to be a more or less general impression that zoning in so far as it affects business and industry is negative—that it is merely a means of keeping business and industry out of residential sections. So pronounced is this view that the very word zoning has commonly come to mean "protection" for dwelling houses, and "restriction" for stores and factories. This situation is most unfortunate for zoning when rightly understood can be made something as positive and helpful for business buildings as for non-business buildings.

That the relative competitive strength of a city in the domestic and foreign markets of the world is frequently conditioned to quite as great an extent by the arrangement of the industries within the city as by the availability of raw materials and the proximity of a consuming public is just beginning to dawn upon us. Economical means of transferring and distributing freight within a city contribute proportionately no less to the development and expansion of its commercial and industrial hinterland than efficient outside connections by rail and water. Heavy terminal costs are as much a drag upon a city's prosperity as high freight charges. Every cent saved in needless trucking means just that much more money available for the extension of the city's commercial and industrial radius by rail or water.

When factories and warehouses are not located with reference to freight terminals, a situation frequently develops where the downtown streets are unnecessarily congested to the inconvenience and financial loss of the whole city. A similar condition results where mutually interdependent industries locate in widely-separated parts of the city instead of near one another. It is maladjustments of this kind that zoning is designed to remedy.

*Paper read before the National Conference on City Planning.

†Executive Secretary, Zoning Committee, New York.

If experts on transportation are correct in telling us that the movement of freight increases as the fourth power of the population, that the freight traffic doubles every time the population increases twenty per cent,—then, the street congestion experienced by our large cities of today is as nothing compared with what our larger cities of tomorrow will be obliged to endure. They will be compelled to adopt every possible means in order to keep traffic moving or choke under their own growth.

The purpose of this paper is, however, not to analyze the various evils from which our cities are suffering. That is the function of the economic and industrial survey. The object of this paper is rather to consider the detailed method of formulating the zoning ordinance and of laying out the several business and factory districts than to dwell upon the necessity for zoning.

The simplicity or complexity of its classification will affect as no other factor the continued success of a plan, for after all, zoning is almost entirely a matter of classification. If the classification is vague, ambiguous or needlessly involved, it is apt to prejudice the operation of the whole plan.

These facts do not seem to be generally appreciated. Some cities appear to think that the prime requisite in a good zoning scheme is elasticity. A certain amount of elasticity is, of course, wanted, but not at the expense of simplicity.‡ The Minneapolis and Berkeley ordinances are both illustrations of instances where extreme consideration has been paid to elasticity. The Minneapolis ordinance subdivides trades and industries into sixteen different classes; the Berkeley ordinance into twenty different classes. Taken in all their possible combinations the building classes of the Minneapolis ordinance would permit of 241 separate and distinct kinds of industrial use districts. The Berkeley ordinance would permit of 381 separate and distinct kinds of use districts. Such elasticity is bound to develop into a situation where ultimately each district will be just a little different from every other district with the consequence that nobody will know what is allowed or disallowed in any district.

It may be urged that it is very unlikely that all of these combinations will ever be taken advantage of. This may be true, but their very possibility will lead to the development of unnecessary complications.§ That such minute refinements in the classification are bound to prove irksome, if not unworkable in practice, is evidenced by the fact that Berkeley after less than two years' experience under its zoning ordinance is now contemplating its radical amendment by reducing the classes of industrial use districts to a maximum of five.

The classification is the substance of every district,—the district merely bounds the classification. Once accepted, therefore, a classification almost must be continued, as any vital modification in its provisions would practically necessitate a general rearrangement of the districts.

Although a zoning ordinance should have a simple classification, it should not sacrifice needed protection for simplicity. This seems to be the main characteristic of the Alameda and Los Angeles ordinances. These ordinances provide only two classes of districts. In the residence districts, the businesses not especially excluded are permitted; in the industrial districts all kinds of business and industry are unrestrained. Neither of these ordinances protects residence streets from stores, nor business streets from large factories or nuisance uses.

The New York resolution in establishing three classes of districts supplies both of these omissions.* The residential districts exclude all kinds of business and industry; the business districts, all kinds of large manufacturing establishments and nuisances. But the New York classification is weak in one respect,—it does not afford sufficient protection to manufacturing. If a factory requires more than 25 per cent of the floor area in a building, or a floor area in excess of the lot area, whichever is the greater, it is forced into the unrestricted district containing all kinds of nuisances.

To put manufacturing establishments and nuisance uses into the same classification thus is apt to produce many unhappy compromises as every unrestricted district will be the result more or less of a balance struck, on the one hand, between the just claims of the district for factory development and, on the other hand, the protection demanded by neighboring residence and business districts against nuisances. In some cases nuisances will be allowed where they will do great harm for no better reason than that the locality is naturally a manufacturing district; in other cases, factories will be prohibited on the ground not that their admission is undesirable, but because the nuisances that might slip into the district with them would prove a serious menace to adjoining districts. The proposed Philadelphia and St. Louis ordinances in creating four classes of districts—residence, business, manufacturing and nuisance—are in this respect a distinct improvement over the New York resolution.

A special feature of the Berkely ordinance, and of the proposed Fresno ordinance, is the exclusion of residences from the heavy manufacturing districts and the nuisance districts. This plan has many distinct merits. The very reasons that make it desirable to exclude factories and nuisances from residence districts apply with equal, if not greater, force when it comes to prohibiting the erection of new dwellings in districts set aside for industrial development. If it is unhealthful for people to live near a factory isolated in the residence district, it is all the more unhealthful for them to live in a home isolated in the industrial district. To permit residence buildings in factory districts, moreover, tends to increase the size of these districts beyond their natural requirements as the area included in this classification must also make provision for the erection of a considerable number of dwellings.

Mixed buildings furnish the real reason for zoning. The success of zoning is to be judged to a very great degree by the completeness with which it segregates different kinds of buildings. This segregation cannot, of course, be perfected unless exclusion is applied to one class of buildings as well as to another. But in considering the present advisability of excluding residences from industrial and nuisance districts, it may be well to recall that much which is even rudimentary in zoning has not as yet been sustained as constitutional by the courts. Until such vital parts of the zoning program as the exclusion of stores from residence streets have been favorably passed upon by the courts, the most deliberate caution should be exercised in extending the scope of the regulations.

How many classes of industrial districts is a question which cannot be settled by the application of theoretical principles. It must be decided after a careful examina-

‡It is a question whether it is not best to establish an administrative board to moderate and ameliorate the rigor of the law in exceptional cases as is done in New York by the Board of Appeals, than to make the classification itself elastic. No matter what care is taken in framing the ordinance, instances will be found where the application of the strict letter of the law will work unnecessary hardship.

§The experience of Minneapolis illustrates this point. The establishment of the first twenty industrial districts there resulted in twelve different kinds of districts. Only three of these combinations were duplicated;—two, three times; and one, five times.

*For an account of the experience under the New York resolution up to January 1, 1918, see article by present writer on "How Zoning Works in New York," National Municipal Review, May, 1918.

tion of the facts in each case. The deciding factors will, however, most generally be: (1) the heterogeneity of the existing and prospective development; and (2) the degree to which different types of development have interpenetrated one another. A small homogenous community may find it necessary to establish but one industrial district, an unrestricted district embracing all kinds of business and industry. More complex communities may, on the other hand, demand two, three, four or more classes of industrial districts. The number should, however, in every case be kept down to the smallest working minimum essential to the performance of the primary objects of the plan.

With a simple classification, no worthy object will be served by keeping down the number of districts. A multiplicity of districts is not something in itself to be discouraged provided the districts are well-selected. Indeed, several small districts may prove preferable to one large one as they can be made to conform more nearly to the existing or immediately prospective development as well as to promote a more uniform type of development. Industrial districts larger than the area demanded by the least restricted class of buildings in the district are apt to result in a very mixed development. The buildings belonging to the more restricted class would perhaps in most instances be better served if segregated by themselves. It is an open question, therefore, whether the general policy in drawing the district boundary lines should not be to limit the extent of the less restrictive classification, each in its turn, to the smallest practicable area.

The form which factory districts, as distinguished from business districts, should assume—whether they should be confined in the heart of the city, dispersed to the suburbs, segregated in concentric zones, laid out along lines radiating from the center, arranged in parallel districts bisecting the city, or discriminately scattered throughout—is one which has as yet not been satisfactorily answered. If one of these methods of distributing factories is more satisfactory than another, the fact has not been conclusively demonstrated. Such industrial surveys as are available do not enable one to say which type or types of districts produce the best results. It may well be that there is no *most satisfactory* method, that the most satisfactory method varies for different trades and industries and under different conditions, and that the most satisfactory method in one community is the least satisfactory method in another community.

Industrial zoning as applied to factories has often been advocated with a view to effecting a decentralization of population, it being supposed that a judicious distribution of factories would at the same time prevent a piling up of the workers in congested tenements. If manufacturing were to be accommodated in the purlieus of the city—and this to a certain extent can be realized, for only those industries which are engaged in manufacture for the local market need be near the business center—each establishment would no doubt in time become the center about which an increasing number of its operatives would seek to live* but this would not in itself solve the problem of land overcrowding. Without drastic regulations effectively limiting the number of families that could be housed per acre, it might only serve to create new congested centers, worse than the old, in the outskirts of the city.† The way to limit congestion of population is to limit it and this, it seems increasingly clear, can only be done by prohibiting more than a given number of families from inhabiting a certain unit of ground.

To scatter the factories for no better reason than that many factories assembled at one place will require a large number of employees is to ignore some of the fundamental facts in the case, as a decentralization of a city's industrial development does not necessarily mean a zoning of workers by place of work. In the first place the different members of a workman's family work in different places. If the head of the family lives where he can walk to his work, will not his daughter who clerks in a department store, or his son who keeps books in a downtown office have to ride? In the second place, small industrial areas can be used intensively, especially when occupied by light manufacturing. In New York there are blocks improved with loft buildings accommodating more than 5,000 operatives.

Is not the answer to the dilemma that intensive industrial development is no excuse for a congestion of population, that a decentralization of population can go hand in hand with a concentration of industry? Factory centers like business centers must have convenient transportation. If there are many workmen employed in one place, it is not essential to house them on the same area which a smaller number would inhabit more sparsely. Through the construction of transit lines the housing area can be enlarged to such an extent that each family will still live in good surroundings.

Action affecting changes in the districts or the classification should be taken only after a most deliberate examination of the facts. After a section has once been subject to certain restrictions a change in the regulations cannot be made without due regard to the effect that the ordinance has had upon the development of the locality. In time it will, of course, become increasingly more and more difficult to make changes of this character without violating the interests which have come into being on account of the plan. Here is a district where certain buildings have been erected which, but for the protection afforded by the regulations, would never have been constructed; there is a district where certain buildings have been prevented from being erected which, but for the restrictions imposed by the ordinance, would have been built. A change in the restrictions will leave neither of these districts in the position which they would have occupied but for the adoption of the law.

The shape, size, location and distribution of industrial districts, as well as their classification, must be determined, not by theory, but by a careful consideration of the concrete facts in each case. The presence of rail and water terminals, the size of the block and lot unit, the width and grade of streets, the character of the existing development, in fact, practically everything connected with the physical plan of a city have to be taken into account and thoroughly studied and analyzed in framing a constructive program for industrial growth. That such a program for future development is essential in every city cannot be questioned. For years the pecuniary losses suffered on account of unregulated building in certain sections of New York have not only equalled, but exceeded those suffered from fire. Investigation might show that this state of facts was true of the metropolis as a whole. The city that does not protect its citizens against fire is generally considered derelict in its sense of public duty. The same is rapidly becoming true of the city that does not protect its citizens against unregulated building.

*Different surveys show that the proportion of employees living within walking distance of their work increases with the length of time that the industry has been established in one place. See Report on Detroit Street Railway Traffic and Proposed Subway, 1915, p. 7. Also Report of Chicago Traction and Subway Commission, 1916, p. 246.

†For a description of how far congestion can proceed, see report prepared by present writer on "Land Overcrowding in Brooklyn," 1916, Tenement House Committee, Brooklyn Bureau of Charities.

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ELECTROLYSIS IN DISTRIBUTION SYSTEMS.

A few years ago the destructive effect of electrolysis on underground distribution systems was a frequent subject of voluminous discussion, and a "scare" over the matter was created that was not warranted by the facts. As this came to be appreciated and those interested in distribution systems became "fed up" on such matter, there was a reaction that tended to reach the other and equally unjustified extreme of apathy. There is in many, if not most cities, a real danger that electrolytic deterioration of the mains and services will take place, and in a great many it is slowly taking place. For example, as described on page 210 of this issue, New Orleans has to replace each year thousands of feet of mains and services that have been damaged in this way.

Electrolysis is therefore a subject of great importance to water works superintendents. Most discussions of its actions and the possibilities of preventing them are given in a style that requires a fuller knowledge of electrical engineering than is possessed by most water works men; but we have endeavored, in the discussion begun last week and continued in this issue, to explain the principles and remedies in a way understandable by any one with an elementary knowledge of electricity. This is based on the latest reports of the United States Bureau of Standards and may confidently be accepted as a reliable presentation of the facts in the light of the most recent information.

FIRE DEPARMENTS AND THE WAR.

In his report for the year 1917, Frank L. Stetson, chief of the Fire Department of Seattle, Washington, calls attention to the effect of drafting and enlistments upon the manual force of the Fire Department of that city. During 1917 fifty members of the department who had had three or more years of experience enlisted or were drafted for war service, and in addition sixty-five who had had three or more years' experience resigned from the department to take up other occupations. The reason why the latter left the department was the higher wages offered by outside employers.

If experienced and trained men continue to leave the department it must, as Chief Stetson says, clearly cripple its efficiency very materially. In order to prevent firemen leaving for other more remunerative work, he earnestly recommends that salaries in the department be raised sufficiently to keep the men satisfied to stay in the service, at least during the war. He suggests that this "be considered as a war measure," by which we understand that he would have the raise in salaries made with the understanding that after the war they would be reduced.

The experience in Seattle has been that of most other cities to a greater or less degree, and apparently the remedy suggested by Chief Stetson for that city must be seriously considered by others as well. Preserving what we have from destruction by fire is even more important than constructing or raising new, whether it be munitions, food, or houses.

PREPARE FOR PEACE.

Peace will not come this year—there is not one chance in a hundred of it. But if it should, it would find the United States unprepared for it. It may come next year—God grant it will; it hardly seems probable that it will be deferred later than 1920. These surmises, however, are based on the assumption that the United States continues to intensify its efforts in the prosecution of the war and suffers no relapse in them through overconfidence. If an American peace is to be brought about in 1919, the entire country must exert every effort toward that end.

But having realized this aim, whether in one year or more, the nations will suddenly find themselves confronted with problems little less difficult than those of organizing for war—the problems of reorganizing for peace. These will result from the disbanding of an army of five million men and the sudden stopping of munitions factories employing many more millions. These men must continue to eat and obtain the necessities of life, and this means that most of them must at once obtain work. Also it seems almost inevitable that prices and wages will fall and be for some time in an unstable condition not favorable to business expansion.

To foresee these conditions and take such steps as can be devised to minimize the evil results is the duty of those who remain at home, and especially of officials, federal, state and city. In our issue of June 22d we urged city officials to begin at once to prepare definite plans for public works which would give immediate employment to returning laborers. If carried out, this should furnish a fairly satisfactory solution to one of the problems.

But there remain others the solution of which is not so evident. What can we do to aid in the early reestablishment in occupation of clerks, mechanics and other skilled men, and of men formerly the owners of businesses which have vanished during their absence? Are those who have endured the hardships, danger and wounds of war to return home to find that those whose hardships have been confined to eating war bread and who have been making war profits will now resist the return of these men to their former positions, whether in shops or in commercial life? On the other hand, can we expect business men to invite and assist in the reestablishment of active competitors in their own lines of business?

It is a difficult problem, which is all the more reason why we should begin at once to look for a solution. One that suggests itself puts the solution up to civic organizations, either official or unofficial; to councils, boards of trade or commissions organized especially for the purpose. These would make it their business to look

after those of their own citizens who have returned. In the case of skilled labor, they would see to it that their old positions or others equally as good, were returned to them. The same with clerks. Merchants would be aided, financially and otherwise, to begin their business again where they left it, so far as this would be possible. Patriotic bodies of women organize now to knit for the soldiers; let them organize then to trade with them.

The problem can easily be brought from the abstract to the concrete by considering individual cases in each city. What will John Smith, who had a successful dry-goods store before he enlisted, do if he should return? Henry Jones, the foreman of a local manufacturing plant, was a good citizen, his family is here and we hope he will return. Should he do so, what opening can we offer him?

These men have left their positions to fight as representatives of their country, and especially of the community in which they lived. It certainly is not too much to ask of each community that it make such provisions that its returning citizens may find awaiting them opportunities for again making a livelihood under as favorable conditions as those which they left.

SERVICE CONNECTIONS IN NEW ORLEANS

Automobile Truck Found Preferable to Mule-Drawn Outfit—Damage Done by Electrolysis—Work Done by Sewer Maintenance Gang.

During the first three months of 1917 the Engineering Department of the New Orleans Sewer and Water Board used, in setting sewer and water house connections, two two-mule outfits for each class of connections, each sewer outfit consisting of a foreman, wagon with driver, three pipe layers and three laborers; and each water outfit consisting of a foreman, wagon with driver, tapper, plumber and four laborers. It was decided to try a combined outfit for both sewer and water connections, and from April first to October, one two-mule outfit was used on sewer connections, and, in addition, a combination automobile truck outfit was used on both sewer and water connections, this outfit consisting of a foreman, a Ford-Smith-Form A truck with a chauffeur, a plumber and tapper, two pipe layers and three laborers. This truck proved so efficient that on October first the two-mule outfits were dispensed with, and a combination automobile tractor-trailer outfit took their places, and the work was done with these two trucks for the balance of the year.

Electrolysis continues to have its effect upon the mains, and especially upon the services, of the water-works distribution system. During the year the amounts of water mains, valves and services removed on account of damage done by electrolysis were as follows: Mains—850 feet of 4-inch, 486 feet of 6-inch, 117 feet of 8-inch and 59 feet of 12-inch; a total of 1,512 feet. Prior to 1917 there had been removed 17,357 feet of mains. No valves had to be removed for this cause during the year, although fifteen had been removed on account of electrolysis previous to 1917. The lineal feet of services removed because of electrolysis during the year totaled 1,483 feet of ⅝-inch, 322 feet of ¾-inch, 546 feet of 1-inch and 140 feet of 2-inch, a total of 2,491 feet. Previous to this year there had been removed for this reason 6,742 feet of services. The total number of services in use at the end of 1917 was 54,212.

In cleaning, maintaining and repairing sewers there were employed as a regular force two gangs, each consisting of a foreman, a two-mule wagon with driver, and four laborers, and a similar gang using an automobile truck instead of a wagon. In the latter part of the year the truck was replaced by an automobile tractor-trailer. Three men were employed in operating flush tanks and flush manholes. These forces cleaned, maintained, and kept in repair 498 miles of sewers from 8 inches to 84 inches in diameter, 6,981 manholes, 2,004 flush tanks and 51,017 sewer house connections. In performing this work the force cleaned 178 house connections, repaired or relaid 42 others and readjusted 178 for sub-drains; placed 52 cleanout boxes over cleanouts; cleaned 12,575 blocks of sewers; operated 2,431 flush tanks and flush manholes; built one new manhole, repaired or rebuilt 36 others, readjusted 708 manhole castings to grade and changed 20 other castings and 117 manhole covers; repaired 41 flush tanks, placed valves in 163 others and repaired 33 such valves and one flush manhole. Under the head of construction work the gang built 758 feet of 8-inch vitrified sewer, 1 new manhole, 3 flush manholes, and 1 flush tank. It also took up and relaid 486 feet of 8-inch vitrified sewer, 17 feet of 10-inch, 128 feet of 12-inch and 98 feet of 21-inch; also replacing 3½ feet of 8-inch vitrified pipe and 241 feet of 10-inch vitrified pipe with cast iron pipe of the same size, and repaired 36 feet of cast iron pipe sewer.

In advance of all new street paving, all sewers and house connections are inspected and any repairs or rearrangements found necessary are made before the pavement is laid.

ROAD WORK IN NEBRASKA.

Under date of August 1st the State Board of Irrigation, Highways and Drainage of Nebraska issued a report for the general information of the citizens of the state dealing with the status of road work in the state at that time. It appears from this report that with three exceptions all of the road work under way or contemplated at that time were earth roads, the exceptions being 5½ miles of 3-inch vertical-fibre brick which was under contract; 14.8 miles of earth road with a sand-clay surface, which was awaiting approval, and 5.94 miles of concrete road, plans for which had been completed but which were held awaiting action of the local authorities. Of the 39 projects listed, the brick road was the only one under contract, although the culverts in connection with three dirt roads were under contract. Plans for six roads had been approved, while those for ten others had been completed.

Commenting upon the small amount of roads other than earth that were included in the program, the Board says:

"An average of 60 per cent of this fund is wasted in the building of temporary roads, which have been severely damaged or destroyed by heavy traffic in muddy weather. Of the $3,500,000, about $1,800,000 has been spent on bridges, of which 50 per cent are permanent. The remainder of the $3,500,000 has been spent on roads. Temporary roads and 50 per cent temporary bridges. Is this the policy we are to continue to follow? In 1917, Nebraska had 148,101 automobiles and trucks, at an average cost of $325 each, based on (unusually low) assessed values. Nebraska has an investment of $48,132,825 in rolling stock. The agricultural engineering department of the state university has made an investigation, and finds that the average car runs 6,000 miles per year. At an approximated cost of five cents per mile it is estimated to cost the owners $44,430,300 in depreciation, operation and maintenance to drive over present roads. It is time the people of Nebraska begin to realize why their state need build permanent good roads. The importance of the problem of motor trucks in relieving the railroads of the burden of transporting foodstuffs in Nebraska is a factor that only good judgment and keen foresight of Nebraska people can solve."

The WEEK'S NEWS

Baltimore's Paving Commission Disbanded—End of New York Health Department "Investigation"—Power Shortage in California—Elimination of Carbon Lamps—Deferred Draft Classification for Firemen and Policemen—Labor Unrest in Cleveland Fire Department—"Fire and Accident Prevention Day"—Restrict Utilities Extensions—Economy of Central Purchasing in Indianapolis—Garbage Troubles in New York and San Francisco—New Street-Cleaning System in Indianapolis.

ROADS AND PAVEMENTS

State Takes Over Toll Road.

Richmond, Va.—The state has taken over the old Valley Turnpike which extends from Winchester to Staunton, in the Shenandoah Valley. The turnpike was established by an act in 1834, which incorporated the Valley Turnpike Co. for the building of a road from Winchester to Harrisonburg. A subsequent act, four years later, extended the road from Harrisonburg to Staunton. The company had a capital stock of $425,000, paid in, three-fifths being owned by the state. It owed the state $25,000 with accrued interest from February, 1841, bringing the total indebtedness to $115,000, which was secured by a mortgage on the property. The road is 92 miles long and is a limestone macadam, which has received bituminous surface treatment. Besides the culverts there are approximately 100 steel and concrete bridges on the road, most of which have recently been constructed at a cost of about $100,000. The total assets of the company are estimated at $633,000, divided as follows: 92 miles of road at $5,000 per mile, $460,000; bridges, $100,000; 13 toll houses, $20,000; road machinery, $8,000; cash deposit in banks, $45,000.

Pier Settles—Big Bridge Closed.

Portland, Me.—The pier supporting the Cape end of the draw of the new million dollar bridge connecting Portland and South Portland, which was completed two years ago, has settled about eight and a half feet. Traffic had been suspended on it within half an hour after the drop took place. Engineers say that the old pier will have to be removed and a new one built; that it will be at least three months before it can be reopened. The bridge is the busiest of any of the approaches to the city and the trucking to two of the forts of the harbor is done over it. It is said that a low estimate of the cost of restoring at the present time is $100,000.

Disband Baltimore Paving Commission.

Baltimore, Md.—The city's paving commission, which was organized following state legislation in May, 1911, has been disbanded for the duration of the war. It was authorized to spend an amount estimated at $10,000,000 to repave the streets. The funds first available consisted of a paving loan of $5,000,000 authorized by the Legislature and approved by the voters. Later a special paving tax was provided which was expected to raise the balance of the $10,000,000 required. To date it has yielded about $1,260,000. Later the Legislature granted the city authority to borrow money in anticipation of the tax in order to expedite the work. To the present time $7,000,000 has been spent, but because of the high cost of material and the difficulty of getting contractors it was decided to discontinue work. During the period of its control, the commission has removed 2,450,000 sq. yd., or 138 miles, of old cobblestone pavement; approximately 2,500,000 sq. yd. still remain in the city. In place of the cobblestone pavements, the commission has laid 1,640,000 sq. yd. of sheet asphalt, 490,000 sq. yd. of granite block, 562,000 sq. yd. of vitrified brick, 92,000 sq. yd. of bituminous concrete and about 72,000 sq. yd. of paving of wood block, cement concrete and other modern materials. The average cost, including the overhead charges, was $2.40 per square yard. Based on a street width of 30 ft. from curb to curb, this represents 161 miles of improved pavement at an average cost of $43,300 per mile. The overhead charge amounted to only 5 per cent of the total expenditure. The commission consisted of Maj. R. Keith Compton, chairman and chief engineer; Douglas H. Thomas, Samuel C. Rowland, Leonidas G. Turner, William S. Thomas, and the late Gen. A. E. Booth. Mayor Preston was a member ex-officio. Upon the resignation of Major Compton, Frank K. Duncan, one of the commission's engineers, was made acting chief engineer.

SEWERAGE AND SANITATION

Red Cross Helps in Typhoid Epidemic.

Hastings, Pa.—With the number of cases reaching fifty-five and the hospitals overcrowded, the Cambria County Chapter of the Red Cross came to the aid of the local authorities in combating the spread of the epidemic. The United Mine Workers' Hall was taken over as headquarters for the relief work. When inspector Andrews of the state board of health arrived, he ordered a thorough overhauling of the water supply system. The source is a well, 600 feet deep, and two springs. The water is pumped to a cistern and a reservoir, from which it is distributed. The cistern was drained, the deep mass of sediment cleaned out and a new bottom placed. The state inspector found that one of the springs, which had been condemned some time ago, was being polluted by house sewage. It will be filled to prevent use.

New York Health Official Reinstated.

New York, N. Y.—Lucius P. Brown, director of the bureau of food and drugs of the department of health, who was suspended last April by Dr. Royal S. Copeland, commissioner of health, for neglect of duty, inefficiency and incompentency, has been unanimously reinstated by the board of health after it had reviewed the hearing of July 5, and Brown's answer filed on that day. The commissioners who took action were commissioner Copeland, police commissioner Richard E. Enright and Leland S. Cofer, health officer of the Port of New York. They compose the board of health. The charges against Dr. Brown alleged that he had failed to recommend the adoption of food standards to the health commissioner, failed to frame amendments to the sanitary code necessary for the effective supervision and control of the sale of food and drugs, failed to exercise control over his subordinates, that he neglected to attend meetings of the boards of which he was a member, and that in 1916 he failed to make a thorough investigation of alleged bribery among subordinates, and that he absented himself from his office. Brown's defense, as stated in his answer to the charges, was that his actions were indorsed by the former administration, although the board of health in its decision severely criticised Brown on each specific charge and recommended the policies which it favors. The board unanimously concluded that Brown was influenced by former superiors. The decision in part states:

"Let it be understood, however, that the dismissal of the charges must in no way whatever be considered an indorsement or approval of the course pursued by Brown. He is acquitted of any wilful misdeed or wrong intent. Undoubtedly he acted conscientiously and with the purest of motives. He conducted his office on a plan of his own, but with no

criticism from the commissioner or the board of health. So far so good; but from this time forward it is to be understood that the director of the bureau of food and drugs shall functionate as the active head and controlling spirit of the bureau. He will be expected to know his employees, to actively superintend and direct their work, and to be conversant with the details of the bureau. It is his duty to attend the meetings of the board of promotions, the committee on health districts, and, except for special and temporary reasons, not to delegate his authority to others, no matter how able they may be. Absences from the department are to be arranged for and when the time of employees is to be used for unusual purposes, there must be full explanation of the purposes on file in the office.

"We must say in all frankness that such conduct of the bureau as this examination has revealed, if practiced under our administration, would result in immediate dismissal. We seriously disapprove Brown's conduct of the office, but our sense of justice will not permit us to inflict undue punishment upon him for the neglect of his disciplinary superiors to exercise, in their turn, such oversight of the department as to prevent such faulty bureau administration. His superiors certainly failed to observe his methods, or else their conception of the office differed radically from ours."

Brown was appointed June 23, 1915, after passing a civil service examination. He formerly held an executive position in the health department of the state of Tennessee. Director Brown's suspension was the chief incident, after Health Commissioner Amster's resignation, of the mayor's "investigation" in the health department. The proposed drastic reorganization of the department was immediately denounced by a vigorous protest from thousands of citizens, numerous civic bodies and Federal authorities, as a raid on the department with a view to wiping out the splendidly organized functional system of administration in which the city was a pioneer.

Two Killed by Gas from Sewer.

New York, N. Y.—Two men died in a hospital from poisoning by gas, probably illuminating gas, which escaped through a sewer. They were overcome in a sewer manhole after they had rescued two companions from a similar fate. The men were sent to repair some wires of the New York Telephone Company. All were employed by the Empire City Subway and Telephone Company. The other two were the first to be overcome by the gas. Their plight was noticed by their fellows, who climbed into the hole carrying ropes. They tied the lines to the unconscious men and shouted to several men who were passing to pull the victims out. After the unconscious had been hauled to the street the others could not reach the ladder and fell to the floor of the manhole, which is about ten feet deep. They remained there for some time before their danger was noticed by two policemen. Both policemen tried to enter the hole to get the men out, but the fumes were too strong. They summoned rescue squad No. 1 ot the fire department, an emergency wagon of the Consolidated Gas Company, and an ambulance. District superintendent Nelson of the gas company put on a gas mask and descended into the manhole. He tied ropes to the men and the rescue squad pulled them to the surface. They failed to respond to treatment. Another member of the repair crew was also overcome by the fumes, but soon recovered at the hospital.

STREET LIGHTING AND POWER

Plan Drastic Power Cuts in California.

San Francisco, Cal.—Drastic economy in the use of electric power until the fall rains shall have refilled the mountain reservoirs is the plan that state power director H. G. Butler has asked Secretary of the Treasury William G. McAdoo to approve for California. Increased use of power in the state for shipbuilding and other war industries, together with the rainfall shortage of last winter and the increased use of power for pumping in irrigation, are the causes which are acting to bring about a shortage of 40 per cent in the power resources of the northern part of the state by October 19, according to the detailed estimates which have been made by the power administrator. "As shipbuilding and agriculture cannot be cut in their use of power," says Butler, "and as electric railways and street and display lighting have already been cut, it will be necessary to reduce the amount of power used from now until October in cement manufacture, gold-dredging and rock crushing. I am now arranging conferences with representatives of each of these interests." Butler says that the actual load at the present time is 5,000,000 kilowatt hours a day, which is now being met by 2,000,000 kilowatt hours produced by steam plants working to capacity; 2,000,000 from water storage and 1,000,000 from stream flow. "But at the present rate of consumption," Butler continues, "the storage would be completely depleted by October 19, leaving a shortage of 40 per cent. And it would not be wise to reckon on rains before that date." It is the plan of the power administrator to cause a reduction of 15,000,000 kilowatt hours per month for the next two months. He gives the present consumption of power in kilowatt hours per month by the larger users as follows:

Electric railways	22,000,000
Irrigation	15,000,000
Lighting	13,000,000
Gold dredging	11,000,000
Shipbuilding	7,000,000
Chemical and powder works	6,000,000
Cement manufacture	5,000,000
Iron works	4,000,000
Mining	4,000,000
Rock crushing	3,000,000

In his message to Secretary McAdoo Butler said, "We are convinced that taking off the gold dredger load would work the least injury to the war needs and propose taking off this load unless you advise that gold production is equally essential to shipbuilding, food production, transportation and other direct war industries. Rainfall will probably relieve the situation in three months, possibly before."

Eliminate Carbon Lamps to Save Fuel.

Washington, D. C.—The United States Fuel Administration, in connection with the manufacturers and dealers in incandescent electric lamps, has worked out a detailed plan for eliminating the inefficient types. The lamp manufacturers, at a recent meeting held in Washington voluntarily agreed to abandon the manufacture of certain types of the inefficient carbon filament lamp in accordance with the program which practically calls for the discontinuance of their manufacture and sale. There are still a few isolated cases where the carbon lamp is required, such as on battleships where excessive vibration or shock calls for a lamp of the sturdier type. But with few exceptions, and these are confined to essentially war industries, the program is expected to gradually eliminate the carbon lamp in favor of the more efficient tungsten lamp. Central stations, public service corporations, municipal plants, and others who may be using carbon-filament lamps are being asked to assist the manufacturers as well as the Fuel Administration in working out this program, inasmuch as sweeping conservation measures are imperative if the war industries and essential public needs are to be supplied. The administration's announcement says: "The importance of this radical step may be judged from the fact that the program as formally adopted at the meeting will mean the saving of more than 1,000,000 tons of coal."

Big New Development at Canadian Falls.

Niagara Falls, Ont.—One of the greatest water development projects of the many centering about Niagara Falls has been launched on the Canadian side of the river. It contemplates an immediate production of 300,000 electrical horsepower, or equal to approximately one-half the present total development on both sides of the river, and it may expand to 1,000,000 horsepower. Actual work on the new channel was begun recently by the Ontario Hydro Commission. The channel will encircle the city of Niagara Falls, Ont., running from the Welland river, a tributary of the Niagara above the cataract, to the escarpment below Queenstown Heights. The power house will be located on the right level. The channel is the first one planned to get the full benefit of the difference in level between Lakes Erie and Ontario, approximately 300 feet. The old companies, with penstocks located close to the foot of the cataract, get a head of about 200 feet. The additional 100 feet head it, it is estimated, will make it possible

to develop the 300,000 horse power with the same flow of water required to develop 100,000 horse power at the Falls. The Ontario Hydro Commission is a provincial body, appointed by the Ontario Government. It distributes power to Ontario municipalities within a radius of 200 miles of the Falls at a low cost. A large part of the current generated on the Canadian side, formerly exported and distributed by an American corporation, has been cut off. Canadian power for Canadian industries has been the motto of Sir Adam Beck, chairman of the commission, and war conditions have brought a speedier application of the policy than had been expected. Part of the current from the new hydro plant will be available for American industries, but only those engaged in war work, Sir Adam has announced. Under the treaty between Canada, Great Britain and the United States the diversion of water on the Canadian side is limited to 36,000 cubic feet a second. The limit on the American side is 20,000 feet. Canada already has authorized the diversion of all but 6,000 cubic feet of her allotment. Under special war permits the American companies are also within a few hundred feet of their limit.

Municipalities Win in Compromise on Rates.

St. Louis, Mo.—The state public service commission has issued an order raising the St. Louis County Gas rates $1.05 per 1,000 cubic feet to $1.40 per 1,000 cubic feet, and from 40 to 75 cents per 1,000 cubic feet for industrial purposes, during the four months following September 1. A 5 per cent discount for payment of bills before the tenth of any month makes the net rate of $1.33 per 1,000 cubic feet. The rates will revert to the old schedule on January 1 unless the company shows reason why the increases should be continued. About 95 per cent of St. Louis county gas consumers are householders. A league of municipalities formed to inquire into gas rates informed the public service commission that the new schedule was satisfactory. This league is composed of the municipalities in St. Louis county, each one represented by its mayor, engineer and attorney. It was organized to oppose the company's request for increased rates. A committee of the league, consisting of the engineers, reported that the company is entitled to increased rates because of war conditions and to avoid a receivership. The committee suggested that the company's demand for a rate of $1.50 for the first 1,000 cubic feet with a decreasing rate for consumption beyond that amount, be compromised at $1.30 to $1.33. The engineers based their report upon statements of the company on its valuation and cost of operation. The suggestion was submitted to the boards of aldermen of the various county cities. Some members of the committee feared that opposition to the increased rates might develop a fight of a year or more and meantime the condition of the company might necessitate a receivership, which, in turn, might be followed by a rate higher than $1.50. Louis H. Egan, manager of the St. Louis County Gas Co., said that a rate of $1.37 was necessary for the company to meet cost of operation and avoid bankruptcy.

FIRE AND POLICE

Deferred Classification for Policemen and Firemen.

Washington, D. C.—According to an announcement by Provost Marshal General Crowder "more latitude will be allowed local boards hereafter in granting deferred classification to firemen and policemen. Heretofore, in such cases, the registrant has had to file with the local board an affidavit signed by the head of the fire or police department, as the case may be, showing, among other things, that he has been continuously employed by the city government he is serving for at least three years. With the questionnaire that will be used in the classification of those who register on September 12 a man claiming dedeferred classification as a highly trained fireman or policeman need file with his local board merely an affidavit signed by the head of the municipal department employing him stating that the registrant is highly trained, the length of time he has been continuously employed and compensated by the municipality he is now serving, and that he can not be replaced without substantial and material detriment to the public service in the municipality. In addition to this the registrant, in making out his questionnaire, must state the position and describe the special duties he performs in his department and set forth why he himself believes that he can not be replaced without substantial and material detriment to the public safety in his community."

New York, N. Y.—Fire Commissioner Drennan, as the result of a conference with Provost Marshal General Crowder, is endeavoring to obtain the 3D classification for all firemen and policemen, whether they have seen three years' service or not, in view of the fact that the fire department is especially short of men and is in need of every man that it has. Provost Marshal General Crowder, according to the commissioner, declined to make a general ruling on the subject in view of the fact that any such ruling from him would have to apply to the country as a whole and would inevitably result in slackers seeking to avoid the draft in many small villages by enrolling in the volunteer fire organizations or by becoming constables. Fire Commissioner Drennan, however, intends to obtain such an interpretation by the district board of the questionnaire with reference to firemen and policemen in class 3D on a certification of the commissioner of either department that they were necessary to the service. The new form of questionnaire facilitates such an interpretation in that it does not qualify the question: "Are you a trained fireman," etc., by the designation of any number of years of service. While Commissioner Drennan is endeavoring to hold the firemen, the draft officials on the other hand assert that many firemen and policemen have complained that eagerness for service is interfered with by the attitude of Mayor Hylan in declining to allow them the difference between the government and city pay, unless they were forcibly drafted.

Firemen Plan Suit for $1,000,000 Back Pay.

Cleveland, O.—Proposal of a suit to recover approximately $1,000,000 claimed as back overtime pay under the eight-hour provision of the city charter, and reports of progress in the formation of a firemen's union to be affiliated with the American Federation of Labor are the latest developments in the labor unrest in the fire department. They came at about the same time as did Mayor Davis' definite promise that members of the fire and police departments will receive a pay increase of 7½ per cent, effective Jan. 1. Mayor Davis made this promise as soon as the budget commission announced it had taken $168,000 from the county's 1919 revenue for use by the city. The mayor also promised the boost would be increased to 10 per cent if a $2,000,000 deficiency bond issue is approved this fall. E. C. Schwan, former judge, who represents the firemen, stated the proposed suit seeking to force the city to reimburse the men for all time over eight hours since the adoption of the shorter hour provision in the city charter last November will be filed in the common pleas court and probably be in the name of one member of the department. It will serve as a test applying for the more than 600 men who have been in the service since the change in the charter. Safety Director Sprosty when informed of these developments said "the city is doing all it can for the men in the way of salary and working conditions and you cannot squeeze blood out of a turnip." According to P. J. Allen, engineer in charge of the high pressure pumping station, the men will claim as overtime all time put in over eight hours since November last, the rate to be figured on the basis of the present monthly salary applying for eight hours' work rather than twenty-one, three hours being allowed for meals. The men are at their station houses twenty-one hours a day, therefore claim thirteen hours a day overtime. They will claim, under the charter provision, a 48-hour working week, which at $125 monthly salary now paid, would rate their weekly pay at

about $25, or about 52 cents an hour. Deducting for one day off in four, under the present system, and figuring overtime of thirteen hours a day, the men will claim about 2,820 hours overtime, making the back pay approximately $1,500 for a man drawing $125 a month. There are 664 men now in the department, most of whom will benefit if the court upholds the petition. Allen stated that plans for the firemen's union, which probably will be a branch of the International Association of Fire Fighters, were progressing and over four hundred petitions for membership had been received from members of the Cleveland department. Director Sprosty refused to comment on the department's attitude toward the union other than to say he would enforce the provision of the rules which prohibited any member of the police or fire department joining or forming any organization within itself other than that which might meet with the approval of the safety director. He said the application of the pension given men for twenty-five years' continuous service might have some effect in influencing the men against joining, as they would lose all benefits of the pension if suspended. Mr. Allen stated about one hundred and fifty men of the department will be eligible for retirement on a pension within a year. Mr. Sprosty said he is experiencing difficulty in filling vacancies and needs men. The new draft, he said, will make recruiting for fire service difficult, as only those in the service three years or more are given a deferred classification. The 7½ per cent increase promised by Mayor Davis it was pointed out, brings the total pay increases for firemen and policemen in the last year and a half to 22½ per cent. The present salaries in the fire and police departments and the increases which will be effected by the contemplated increases are as follows:

Fire Department.

	Present Pay.	On 7½% Basis.	On 10% Basis.
Chief	$4,600	$4,945	$5,060
Assistant chief	2,888.40	3,105.03	3,177.24
Second assistant chief	2,656.80	2,856.06	2,922.48
Batallion chiefs and machinery superintendent	2,310	2,483.25	2,541
Fire wardens	1,732.20	1,862.11	1,905.42
Captains	1,680	1,806	1,848
Lieutenants	1,575	1,693.13	1,732.50
Engineers	1,663.20	1,787.94	1,829.52
Assistant engineers	1,489.20	1,600.79	1,638.12
Firemen, first year	1,020	1,096.50	1,122
Firemen, second year	1,140	1,225.50	1,254
Firemen, thereafter	1,411.20	1,517.04	1,552.32

Police Department.

Chief	$4,600	$4,945	$5,060
Inspector	3,000	3,225	3,300
Deputy inspectors	2,500	2,687.50	2,750
Captains	2,286	2,457.45	2,514.60
Lieutenants	1,680	1,806	1,848
Sergeants	1,575	1,693.13	1,732.50
Patrolmen, first year	1,200	1,290	1,320
Patrolmen, thereafter	1,411.20	1,517.04	1,552.32

Policemen Get $500,000 to Equip Substitutes.

New York, N. Y.—By offering spectacular attractions on two field days at Sheepshead Bay, the policemen of the city have succeeded in obtaining $500,000 from the sale of tickets. They were aided by many citizen's committees and committees of society women. Hundreds of thousands witnessed the games, airplane and dirigible performances, sham battles, trench scene reproductions, drilling by the Women Training Corps of the Police Reserve, singing by opera stars and other performances. In a letter sent out by fourth deputy comissioner of police Frederick A. Wallis to citizens, the following appeal was made.

As you probably know, an alarming condition confronts the adequate policing of New York City because of the war. The Federal Government is rapidly depleting our ranks through draft and enlistment, and if this drain continues we will lose within the next few months over 3,000 of our young vigorous men.

It is utterly impossible for the city to increase the Police Force because the age of recruiting policemen is practically that of the Government selective draft. Furthermore, if desirable men were available the City could not employ them because it is not in financial position to do so.

Therefore, the City has been driven to the necessity of appealing to its loyal and self-sacrificing citizens to volunteer their services. The response has been wonderful, 10,000 men and 3,000 women having been selected. These volunteers will serve without pay, but must be officially uniformed and equipped with police authority. This will require over three-quarters of a million dollars.

This fund is to be raised through tickets to the Annual Police Field Day Games and Concert, Sheepshead Bay Motordrome, August 31. A magnificent program has been prepared —aerial warfare by 70 flying machines, singing by Metropolitan Opera stars, sham battles, etc.

We are sure you would not want to see the safety and protection of this city placed in the hands of troops of the Federal Government, the service of whom is indispensable in France.

Tickets not required for your own use can be given to sailors and soldiers.

Fire and Accident Prevention Day Postponed.

Washington, D. C.—At the request of Secretary of the Treasury McAdoo, Fire and Accident Prevention Day is this year to be postponed from October 9 to Saturday, November 2. The object of the postponement is to avoid clashing with the Liberty Loan Campaign, and it is understood that the co-operation of the Four Minute Men will be available in connection with the deferred observance. In Canada the original date may be adhered to as more convenient. Persons who desire assistance in arranging for motion picture displays, speakers, or otherwise, are invited to communicate with W. T. Colyer, secretary, Fire and Accident Prevention Day Committee, 87 Milk street, Boston, Mass.

Army Piers Destroyed by Fire.

Norfolk, Va.—Seven sections of Pier 1, in course of construction at the army naval base at Sewells Point were wrecked by fire, entailing damages that will aggregate over $50,000 and probably delaying the completion of the structure several weeks. There were no casualties. The fire was caused by the exhaust of an engine, which ignited a quantity of creosote and creosoted logs. The flames flared up suddenly and spread very rapidly owing to the inflammable nature of the surrounding materials. Firemen were forced to use dynamite several times in order to get beneath concrete floors to reach the fire. The Norfolk fire department, appealed to for aid by the military authorities, rushed motor engines to the scene and soon had the fire under control. The damaged sections of the pier will be replaced at once, it is officially announced.

GOVERNMENT AND FINANCE

Asks Postponement of Utilities Extensions.

Washington, D. C.—Extensions of electric railway lines, electric lighting systems, water mains, pavements, or other public utility enterprises not absolutely essential to the war should be postponed until peace times, says the Capital Issues Committee in a letter sent to all state public utility commissions. These state bodies were urged not only to disapprove additions and betterments requiring capital expenditures, but also to remove from public service corporations, if possible, the necessity of carrying out contract or franchise obligations which might be dispensed with in the war emergency. The letter was the first of several measures planned by the Capital Issues Committee in co-operation with the Treasury and other financial agencies to prevent dissipating of capital in less essential enterprises. In writing to the state commissioners the committee says:

"You are, of course, familiar with the creation by Congress of the Capital Issues Committee for the purpose of giving effect to the Government's policy of 'War Business First' by supervising the issuance of new securities for capital expenditures. It is plain that all of us must avoid every unnecessary use of capital, involving also the use of labor and materials, in order not to interfere with the financial and industrial requirements of the government in its paramount task of waging and winning the war.

"If the men, money and material, which the government needs, are to be made available for essential war purposes, there must necessarily be a considerable degree of sacrifice on the part of individuals, communities and corporations in adjusting themselves to the substitutions and changed standards which the situation compels. Existing facilities must be made to serve in place of new ones, regardless of temporary inconvenience and discomfort, unless the publice health or paramount local economic necessity is involved.

"May we suggest to you that these considerations apply with marked force to the public utility situation. The extensions and betterments which public service corporations are accustomed to make in normal times, either on the initiative of their own enterprise or by direction of the

regulating commissions under which they operate should, in our opinion, be postponed until after the war, unless an immediate war purpose is served, and may we ask of you consideration of the propriety of deferring even the performance of contractual obligations arising from franchise or other local requirements, when no military or local economic necessity is served by such expenditures.

"The Capital Issues Committee feels certain that your commission will recognize the paramount need of the national government when passing upon proposed additions and extensions by public utility companies, and asks that you cooperate in giving effect to the purposes of the government by restricting every unnecessary use of capital, labor and materials for extensions, betterments, street paving, or other purposes, even waiving, if in your power, the legal requirements that obtain in times of peace, until the present emergency has passed."

Selling Denver's Water Bonds.

Denver, Colo.—One of the largest undertakings in the way of municipal financing for many months was made public in the offering of $10,800,000 4½ per cent water bonds of the city and county of Denver, Colo. The bonds are being offered by a syndicate headed by Harris, Forbes & Co. and E. H. Rollins & Sons, of this city, and the International Trust Company, and Boettcher, Porter & Co., of Denver. The price is 95¼, which yields 4.80 per cent on the money invested. The bond issue was authorized by the taxpayers of Denver, the proceeds to be used to buy the plant and distributing system of the Denver Union Water Company at a price of $13,970,000. The net bonded debt of Denver, according to bankers interested in the new issue, is less than one-eighth of 1 per cent of the assessed valuation. The bonds will fall due Nov. 1, 1948. They are exempt from Federal income taxes and are a legal investment for savings banks in several states.

City Employes Get Wage Increases.

Albany, N. Y.—The board of estimate and apportionment has granted increases in the wages paid to employes of the department of public works in the bureaus of water, streets and parks. The increases are:

Bureau of water—Skilled laborers, meter and pumping department and general utility man from $23 per week to $4.25 a day; general utility man at laboratory, from $21 per week to $4.25 a day; meter inspectors, from $80 per month to $90; keepers of the reservoirs and night watchman at filtration plant, from $16 per week to $18; machinists, from $1,300 per year to $5 per day; assistant foreman, from $3.50 per day to $4.25; caulkers, from $3 per day to $4; skilled laborers, from $2.50 per day to $3.50; assistant tappers, from $16 per week to $3.50 per day; drivers, from $13.50 a week to $3 per day; laborers at filtration plant, from $2.50 to $3 per day; digging laborers, from $2.50 to $2.75; common laborers, from $2.25 to $2.50; cleaning women, from $1 per day to $1.45.

Bureau of streets—Flusher operator, from $3.50 per day to $4.50; assistant machinist, $4 per day; foreman, from $3 to $3.25 per day; sewer laborers, from $2.50 to $2.75; laborers, from $2.25 to $2.50; pavement repairmen's helpers, from $2.25 to $2.50; night watchmen, from $2.35 to $2.50; cleaning women, from $1.25 to $1.45.

Bureau of parks—Laborers and special officers, from $2.25 to $2.50 per day.

Purchasing Agent Saves Money.

Indianapolis, Ind.—The practice of having everything bought for the city departments pass through the office of Dwight S. Ritter, city purchasing agent, is now well established and every department is co-operating with the purchasing agent in getting a dollar's worth of value for every dollar spent, according to a semi-annual report filed with Mayor Charles W. Jewett by Mr. Ritter. A comparison of the expenditures made last year and the first six months of this year cannnot be made because last year many of the city departments bought supplies and materials and did not go to the purchasing agent. It is Mr. Ritter's idea that practically everything should pass through the purchasing agent's hands as in a private business enterprise. The volume of business handled by Mr. Ritter and his assistants in the last six months is shown in the report as follows, 1917 figures for the same period being given also: Requisitions from city departments, 1917, 3,403; 1918, 4,190; orders placed, 1917, 3,511; 1918, 4,814; emergency orders without arranged prices, 1917, 66 per cent; 1918, 14 per cent; value of invoices checked and passed for payment, 1917, $202,962.89; 1918, $288,782.92; cost of department, 1917, $4,050; 1918, $4,400. Mr. Ritter says in part in his report: "We have tried to study each individual item on a requisition and order it to the best advantage, instead of merely bulking each lot. This means that we have placed 35 per cent more orders than were placed last year during the same period, and in this number were 624 more orders than requisitions from departments, when last year the difference was only 168. Closely associated with this effort to order from the right source is our continual drive to get the right price and to have it understood beforehand. Our success is shown by the reduction in emergency unpriced orders from 66 per cent last year to 14 per cent this year. This 14 per cent consists of small orders, largely for repair parts needed immediately to keep equipment in service. The total value of bills passed through the office this year can not be compared with last, because the circumstances are not parallel. We now handle such accounts as telephones, electric lights, gas, contract steam heating, insurance, repairs to buildings, horseshoeing and the needs of the city judge, city clerk and sanitary commission, which did not go through this office last year. Formerly many delays in payment of accounts were due to business men accepting verbal orders from city employees. When the charges were rendered to the city it was most difficult to check them. We have urged all to insist on written orders so as to give us advance notice of every transaction, settle the terms and price wherever possible, and prevent delay in O. King their invoices for payment. By paying each month's bills on the 10th of the following month, we are entitled to considerable cash discount, which was never taken before. During April this amounted to $63.83, in May to $115.75, and in June to $70.98. This is at the rate of $1,000 a year. The checking of telephone bills and rearrangement of the service will save about $2,000 a year and give us better service."

STREET CLEANING AND REFUSE DISPOSAL

New York's Garbage Disposal Difficulties.

New York, N. Y.—The citizens of Brooklyn are determined to oppose vigorously any attempt on the part of the city to re-establish the garbage disposal plant on Barren Island. The contract of the Metropolitan By-Products Company, which now handles the city garbage, runs until December 31, 1922. The company, which has been in the hands of receivers, is again in financial difficulty, due, its officials claim, to no fault of theirs, but to circumstances for which the city is partly responsible. Inability to obtain credit caused a recent temporary shut-down of the company's plant on Staten Island, and this fact, coupled with the objection which the Staten Islanders are making to its presence, is being made use of in an attempt to have the city cancel the contract. It is understood that strong pressure has been brought to bear upon Mayor Hylan to induce him to act.

Should the Staten Island plant be closed down, it was pointed out that the reopening of the Barren Island plant would follow almost as a certainty, due to the fact that there is no other place available. To erect a new plant, even if materials could be secured, would take anywhere from six months to a year, experts declare. A factor which may be important in the situation is the United States Government, which recently issued a nation-wide appeal for the conservation of garbage for the manufacture of glycerine, used in high explosives. The federal government is now utilizing the entire glycerine output of the Metropolitan By-Products plant, amounting to 1,000,000 pounds a year. Negotiations are under way to have the federal government take over the operation of the Staten Island plant for the duration of the war, and it is understood the project is receiving earnest consideration. Street Cleaning Commissioner Arnold B. McStay said, concerning the rumored resumption on Barren Island: "As far as I know it is very improbable that Barren Island will

ever see a garbage plant again. The old plant is dismantled. The objectionable odors still emanating from the island occasionally are due to the horse rendering establishment there with which, of course, the city has nothing to do. Moreover, it would cost several hundred thousand dollars to put the old Barren Island garbage plant into shape for operation." Commissioner McStay added that the city proposes to step in and operate the Staten Island plant if there is any further failure on the part of the present private management. Such an attempt, however, will be opposed by the company.

To Abolish Ward System of Street Cleaning.

Detroit, Mich.—The end of the old and much-criticised system of street cleaning by ward gangs has been announced by H. H. Esselstyn, new commissioner of public works. He is working out a new method which will be ready to be put into operation in a few weeks, he said. Under the present system each ward has a separate appropriation, foreman and gang for its street cleaning, the amount of the appropriation usually depending on the "pull" of the aldermen of the ward. It has resulted in practically 21 separate and unrelated street cleaning systems. Each gang has had a variety of problems to meet as its ward territory took in the variegated districts extending north from the river, in nearly every instance covering slums and unrestricted residential neighborhoods. Under the new plan Mr. Esselstyn is devising the city will be divided into districts according to kind and density of population. In congested localities, inhabited chiefly by foreign elements, the zones will be small and the gangs equipped with special apparatus to meet special problems. Other gangs will be assigned to residential districts, where a different manner of work is necessary to procure the most efficient results. Through the change Mr. Esselstyn hopes to obtain cleaner streets without extra outlay of money. He is striving to, and declared he would, keep Detroit streets in good condition on the present appropriations, which would break the record, these funds usually being depleted before the end of the fiscal year. Beside the gain in efficiency and cleanliness the change will rid the street cleaning department of the last vestige of politics. The ward cleaning gangs, with the ward system of electing aldermen, have been charged as partly responsible for the "machine" rule of Detroit for years past. This will be abolished by creating districts and keeping a closer supervision over the street cleaning employes, Mr. Esselstyn said. Before announcing the change Mr. Esselstyn conferred with Mayor Marx and procured his approval. Corporation Counsel Frazer has ruled that the change may be made without the permission of the common council so long as the ward appropriations are fairly expended in the wards for which they were made. City Engineer Hubbell and J. J. Knight, superintendent of street cleaning, are co-operating with Mr. Esselstyn in mapping out the new system. Commissioner Esselstyn is also beginning a campaign to reduce street littering.

Condemns Wasteful Garbage System.

San Francisco, Cal.—Condemning San Francisco's garbage system as extravagant and wasteful of materials essential to the war, acting food commissioner Preston McKinney flayed opponents of an improved garbage collection and disposal system. McKinney points out that a ton of garbage contains enough grease for fourteen shells for the French "seventy-fives." His statement follows in part: "An effort to establish a garbage utilization plant in San Francisco is meeting with considerable difficulty because of local collection conditions. A private system of scavengering which has become entrenched is acting as a detriment. No attempt has been made to justify the present system from either an economic or sanitary standpoint. The present system apparently is a 'good thing' for those having San Francisco's public practically at their mercy, and they are naturally adverse to any changes. Collections are now being made by scavengers who charge each household so much per week or per month for their services. While these sums are seemingly small, the total amount paid out by San Francisco's citizens is considerably in excess of the cost paid in other cities of equal population where the cost is met from the general tax funds. It is not surprising, therefore, that the scavengers do not want utilization methods. The garbage collected by the scavengers from householders amounts to about 160,000 tons a year, which is dumped, burned or otherwise destroyed, and no attention is paid to the separation from other household waste, such as crockery, tin cans, paper, etc. The garbage from hotels and restaurants is not collected by scavengers, but it usually sold by the proprietors to farmers or pig raisers. It is estimated that this amounts to from 900 to 1,400 tons per month. The hotel and restaurant proprietors, it seems, have formed a part of the opposition which the scavengers are advancing to a utilization plant, on the ground that if the garbage is collected by the municipality they will be deprived of a source of revenue. The food administration has no desire to interfere with local affairs, but takes the position that the waste of garbage at this time is distinctly a wrong policy and one that should be changed. A system of garbage collection which is wasting millions of pounds of grease each year—and this grease can be translated into explosives, soaps, fertilizers and other needed war materials—is looked upon as viciously un-American and unpatriotic, and should not be tolerated. It is particularly regrettable that where there is a positive movement for conservation along these lines objection should be made from a group of men who base their opposition on personal gain."

LEGAL NEWS

A Summary and Notes of Recent Decisions—Rulings of Interest to Municipalities

Self-Appointment by City Officials.

(Ga. App.) Under Pol. Code 1910, § 862, conferring appointing power on mayor and council, without expressly authorizing self-appointment, it is contrary to public policy to permit them to exercise that power by appointing one or more of their own body.—Felker v. City of Monroe, 95 S. E. 1023.

Crossing at Place Other Than Street Intersection.

(Iowa) In action for injuries due to collision of plaintiff pedestrian with defendant's automobile, an instruction in effect that greater care should be observed by pedestrians in crossing street at other than intersection was not erroneous.—Livingstone v. Dole, 167 N. W. 639.

Auto License Plates—Evidence of Ownership.

(Mich.) Under Comp. Laws 1915, §§ 4793-4835, as to registering autos driven on highway, and displaying license number thereon, proof of license number on auto driven on street into plaintiff, and of person in whose name it is registered, is prima facie evidence of ownership.—Hatter v. Dodge Bros., 167 N. W. 935.

City Use of Park—Ponies for Children.

(Mo. App.) A city's use of a park to provide Shetland ponies of reasonable gentleness, upon which children may ride, properly attended, either for a consideration, or gratis, is not foreign to the object for which public parks are maintained.—Longwell v. Kansas City, 203 S. W. 657.

Kansas City Charter 1909, art. 13, § 39, providing that shows and exhibitions shall not be given in parks, does not prohibit the city from furnishing Shetland ponies for children in its parks.—Id.

Municipal Immunity—Governmental Enterprise.

(N. D.) Municipal corporation's immunity on ground that it is engaged in a governmental enterprise does not apply alone to cases concerning public health, but includes matters of public safety and the safety of the property of the community.—Moulton v. City of Fargo, 167 N. W. 717.

City Care for Safety of Sidewalks.

(Iowa) City which fails to use reasonable care to keep sidewalks in reasonably safe condition for travel is liable for resulting injuries to persons, although not the insurer of safety of those using sidewalks.—Allen v. City of Ft. Dodge, 167 N. W. 577.

A city need not maintain its sidewalks in a reasonably safe condition, but is required only to exercise reasonable care to maintain sidewalks in a reasonably safe condition. —Id.

Wading Pool in City Playground—Nuisance.

(Wash.) Where wading pool in city playground was drained and cleaned each Friday, that a broken bottle was cast therein by some one between Friday and a Sunday, when a girl wader was injured by cutting her foot on such a bottle, would not be sufficient to charge the city with maintaining a nuisance.—Clark v. City of Seattle, 172 P. 1155.

Police Power—Licensing Motor Vehicles.

(Mass.) Authority vested by St. 1913, c. 429, in city council of Springfield, to delegate authority to issue licenses to boards or officers, includes powers conferred in future, as well as those already conferred.—Commonwealth v. Slocum, 119 N. E. 687.

Power vested in city council by Legislature to delegate authority to grant licenses, when not made imperative, implies discretion to delegate power to refuse licenses; right to delegate one including other.—Id.

(Mass.) Ordinance of city of Springfield, relating to licensing of motor vehicles used for transportation of passengers for hire, held constitutional, as reasonable exercise of police power.—Commonwealth v. Slocum, 119 N. E. 687.

(Mass.) Regulation of operation of vehicles used for conveyance of passengers is recognized subject for local by-law or ordinance; police power extending to reasonable control of travel on highways in interest of public, and including automobiles.—Commonwealth v. Slocum, 119 N. E. 687.

Requiring Owner to Connect With Sewer—Police Power.

(N.J.Sup.) Ordinance requiring abutting landowner to connect his buildings with a public sewer, though he already has a private sewer, is not an unreasonable exercise of the police power, as public health may be maintained by the prevention of nuisances, as well as by their abatement.—Fenton v. Atlantic City, 103 A. 695.

It is no answer to prosecution for violation of an ordinance requiring that adjacent buildings be connected with a public sewer that it discharges the same body of water as owner's private sewer.—Id.

State Control Over City Streets.

(Ind.) Streets of municipality are parts of general highways of state, and, as such, state has primary control thereover when the interests of the public are concerned, and such power thereover as municipalities have when the interests of the general public are involved.—Farmers' & Merchants' Co-op. Telephone Co., Boswell, Ind., v. Boswell Telephone Co., 119 N. E. 513.

Racing by Truck Drivers—Liability for Death.

(N. Y.) If defendants' servants in concert raced their trucks in street, driving so fast as to endanger safety of foot passengers, both defendants were liable for death of pedestrian struck by one truck.—DeCarvalho v. Brunner, 119 N. E. 563, 223 N. Y. 284.

(N. Y.) In action for death of person struck by one of two racing trucks, each owned by a defendant, whether fast driving was of such character as to endanger safety of foot passenger in street, and whether it was an act done in concert, held for jury.—De Carvalho v. Brunner, 119 N. E. 563, 223 N. Y. 284.

Incorporation—Court Action—Taxpayers' Objection.

(Mo. App.) In making an order for the incorporation of a city, the county court acts "judicially," and the order is subject to appeal to the circuit court under Rev. St. 1909, § 3956, providing for appeals from "judgments" of the county court, and section 4091, providing the circuit shall hear such appeals de novo; and this is true, though the circuit court has no original jurisdiction to incorporate a city.—In re Incorporation of Uniondale, 203 S. W. 508.

Owners whose property would become subject to the burdens of municipal taxation have the right to object to the county court's order of incorporation of territory embracing their property, and may appeal therefrom, challenging the sufficiency of the petition for incorporation. —Id.

Refilling After Sewer Construction—Liability.

(Tex. Civ. App.) Where railway terminal company had been granted permit by city to construct sewer, company owed to public duty to see that refilling was properly tamped, in compliance with ordinance to leave street or sidewalk in as good order as before.—Houston Belt & Terminal Ry. Co. v. Scheppelman, 203 S. W. 167.

Terminal railway company, which had constructed sewer under public street, held not relieved from liability for personal injuries to pedestrians from defects in refilling excavations because city had taken over sewer system. —Id.

Refilling with Wrong Material—Liability for Damages.

(Wis.) Plumber digging trench in macadamized street for sewer connection, who failed to comply with express requirement of his work permit that trench he refilled with sand and crushed stone, but filled trench with soft clay, was negligent, and liable for damages to automobile which broke a wheel in depression caused by the clay settling.—Zimmer v. Schmitt, 167 N. W. 739.

Catch-Basins for Usual Rains Only Required.

(Ky.) City is only required in improving alley to furnish catch-basins sufficient to carry off usual rains, and is not liable for damages by flooding caused by extraordinary and unusual rains which could not have been anticipated by persons of ordinary experience and prudence.—City of Lexington v. Henderson, 203 S. W. 528.

Restraint of Waste of Funds by Taxpayer.

(N. Y. Sup.) At common law taxpayer as such has no right of action against public officer to restrain or prevent waste of public funds or injury to public property, or threatened illegal official act, unless violation of public right affects him injuriously in some peculiar manner.—Schieffelin v. Craig, 170 N. Y. S. 603.

Municipal Power—Firemen's Salaries.

(Tenn.) Municipal corporation's rights with reference to exercise of its governmental functions are governed by those provisions of Constitution referring to it as a branch of state.—Smiddy v. City of Memphis, 203 S. W. 512.

A city has no governing power separate from power which Constitution has given to Legislature.—Id.

(Tenn.) Act of adopting, installing, equipping, and operating a fire department is a governmental function and not a municipal one.—Smiddy v. City of Memphis, 203 S. W. 512.

(Tenn.) Legislature could directly and without intervention of city employ its entire police force or its entire fire department at such salaries as it deems wise.—Smiddy v. City of Memphis, 203 S. W. 512.

(Tenn.) Priv. Acts 1917, c. 488, amending charter of Memphis by increasing salaries of employees of fire department, except chief 12 per cent is not unconstitutional. —Smiddy v. City of Memphis, 203 S. W. 512.

THE MUNICIPAL INDEX

In Which Are Listed and Classified by Subjects All Articles Treating of Municipal Topics Which Have Appeared During the Past Month in the Leading Periodicals.

It is our purpose to give in the second issue of each month a list of all articles of any length or importance which have appeared in all the American periodicals and the leading ones published in other countries, dealing more or less directly with municipal matters. The Index is kept up to date, and the month of literature covered each time will be brought up to within two or three days of publication. Our chief object in this is to keep our readers in touch with all the current literature on muncipal matters. In furtherance of this we will furnish any of the articles listed in the index for the price named after each article, except that where an article is continued in two or three issues of the paper, the price given is for each of said issues. In addition to the titles where these are not sufficiently descriptive or where the article is of sufficient importance, a brief statement of its contents is added. The length also is given, and the name of the author when it is a contributed article.

ROADS AND STREETS.

Traffic:

Highway Carries Twelve Times as Much Local Freight as Railroad. Shipments by Baltimore road increase 480 per cent in year, saving railways 39,923 ton-miles; Pennsylvania road shows considerable gain in time of shipment over railway. 1 ill., 1,600 words. Engineering News-Record, August 1, 20 cts.

Limit Truck Capacity or Build Better Roads. Discussion in "Public Roads" by state highway officials shows present construction inadequate for traffic. 1,800 words. Engineering News-Record, August 1. 20 cts.

Notes on the Location and Construction of Trunk and Feeder Roads, with Special Reference to Their Grades and Width in Relation to Traffic. By W. T. Thompson. 2,200 words. Western Municipal News, August. 15 cts.

Road Designing:

Prepare Next Season's Highway Program. Editorial calling attention to the necessity of doing so to obtain approval of Highways Council. 700 words. Municipal Journal, August 31. 10 cts.

Reduce Grades by Spiral Development of Hillside Streets. 2 ills., 700 words. Engineering News-Record, August 15. 20 cts.

Engineers Advocate Hard Paving on Steep-Grade Streets. Practice in several cities throughout the United States to use stone, brick and concrete either for full width or for strips in combination with asphalt. 3 ills., 2,400 words. Engineering News-Record, August 15. 20 cts.

Width of Roadway and Corner Cutoff. Plans made by the City Plan Commission of Cleveland for increasing corner radio and angle of vision. By Robert H. Whitten, City Plan Advisor. 3 ills., 700 words. Municipal Journal, August 31. 10 cts.

Impervious Bituminous Wall Suggested to Prevent Seepage Under Paving. Extensive study made of vertical movements of pavements with reference to frost action; distribution of moisture in clay and loam subgrades, and effect of walling off shown by charts. 4 ills., 2,200 words. Engineering News-Record, August 1. 20 cts.

Construction:

Five-Mile Road Job Served by Central Mixing Plant. How concrete was laid on Mt. Carmel-Cheshire road in Connecticut. 2 ills., 800 words. Concrete, August. 25 cts.

The Use of Modern Machinery in County Road Construction. Consideration of scrapers, graders, wagons, drills, concrete mixers and other kind of machinery. C. B. Scott. 2,000 words. Good Roads, August 31. 15 cts.

Tar Bound Bases for Brick Pavement. By John S. Crandell. 2 ills., 1,200 words. The American City, August. 40 cts.

The National Pavement in New Haven. Use of this material for resurfacing over old macadam and brick pavements. 3 ills., 2,400 words. Municipal Journal, August 24. 10 cts.

Asphalt Resurfacing in Los Angeles. Municipal asphalt plant furnishes material for wearing surfaces, which is applied by surface heating method, all work being done by day labor. By Charles W. Geiger. 6 ills., 2,500 words. Municipal Journal, August 17. 10 cts.

Gravel Roads in Middlesex. General description of work on English road. By Charles Talbot, county engr. of London. 1,200 words. Municipal World, August. 15 cts.

Maintenance:

Iowa County Puts Road Maintenance on Sound Basis. Patrol men with team and wagon get $150 per month; county engineer gives clear instructions. Dragging a separate item. By J. L. Parsons, county engr. Webster Co., Iowa. 1,300 words. Engineering News-Record, August 8. 20 cts.

Resurfacing Reduced by Patrol System on Boulevards. Crews work continuously in Kansas City, making all repairs with stone and hot asphalt; dust laid by power sprayer. By Ralph R. Benedict, asst. supt., Bd. of Park Comrs., Kansas City, Mo. 2 ills., 1,000 words. Engineering News-Record, August 29. 20 cts.

Ton-Mile Charge to Maintain Highways Suggested. As they are public utilities, funds for their upkeep might be raised as they are for other public utilities. By J. Strother Miller, Jr., Barber Asphalt Paving Co., Maurer, N. J. 1,000 words. Engineering News-Record, August 29. 20 cts.

Use of Glutrin in Orange County. Description of experience of New York State Highway Department with this material. 2 ills., 600 words. Municipal Journal, August 3. 10 cts.

Miscellaneous:

Standard Forms for Tests, Reports and Methods of Sampling for Road Materials. From bulletin of the Office of Public Roads. 8,000 words. Better Roads & Streets, August. 20 cts.

The State Highway Law and Its Relation to the Cities. Paper before League of Texas Municipalities. By O. J. S. Ellingson. 12,000 words. Texas Municipalities, July. 25 cts.

Method of Numbering County Bridges and Making Bridge and Drainage Map. Suggestions by the Iowa Highway Commission. 1 ill., 1,200 words. Engineering and Contracting, August 28. 15 cts.

General Policy of the Department of Public Roads of Kentucky Highways During the Period of the War. By Rodman Wiley. 2 ills., 1,000 words. Better Roads and Streets, August. 20 cts.

Federal Approval of Highway Construction. Announcement by the U. S. Highways Council of its policy in approving highway work. 1,100 words. Municipal Journal, August 31. 10 cts.

SEWERAGE AND SANITATION.

Sewage Treatment:

Cantonment Sewage Treatment. Editorial discussion of the difficulties encountered. 700 words. Municipal Journal, August 24. 10 cts.

Sewage Engineering and Sewage Disposal. Resume of present practice. By J. Edward Willcox. 1,600 words. Municipal Engineering and Sanitary Record (London), August 1. 15 cts.

Imhoff Tank Sludge Makes Raspberries and Lettuce Grow at Toronto. Letter by I. H. Nevitt, supt. main sewage disposal works, Toronto, Ont. 1 ill., 600 words. Engineering News-Record, August 22. 20 cts.

Miles' Acid Process May Require Aeration of Effluent. New Haven experiments show that sulphur dioxide in effluent deoxygenates several volumes of diluting water. By F. W. Mohlman, with Engineering Division, Connection State Bd. of Health, New Haven, Conn. 4 ills., 1,400 words. Engineering News-Record, August 1. 20 cts.

The Deoxygenating Effect of the Effluent from the Miles Acid Process of Sewage Treatment. Some results from experiment conducted at New Haven recently concluded. By F. W. Mohlman. 1 ill., 1,400 words. Engineering and Contracting, August 14. 15 cts.

Auto-Eductor Solves Sewage Tank Difficulty. Used for removing great amount of greasy scum and sludge from sceptic tank at one of the cantonments. 1,600 words. Municipal Journal, August 24. 10 cts.

Better Operators for Water and Sewage Treatment Plants. New Jersey law provides for examination and licensing under direction of State Department of Health. 800 words. Engineering News-Record, August 15. 20 cts.

Sewer Construction:

Sewering an Army Cantonment. Description of rapid construction of segment block and lock joint pipe sewers at Camp Bowie. 4 ills., 900 words. Municipal Journal, August 24. 10 cts.

Sewer Maintenance:

Catch Basin Cleaning in Cambridge, Mass., with Orange Peel Bucket. Description of appliance and method of use. By L. M. Hastings. 1 ill., 600 words. Engineering and Contracting, August 14. 15 cts.

WATER SUPPLY.

Quality of Water:

Chemical and Bacteriological Examination of London Waters. From a report to the Metropolitan Water Board for the year ending March 31, 1918. By Sir A. C. Houston. 6,500 words. Canadian Engineer, August 1. 15 cts.

The Practicability of Adopting Standards of Quality for Water Supplies. Summary of discussion by Robert B. Morse and Abel Wolman before A. W. W. A. 800 words. Engineering and Contracting, August 14. 15 cts.

Advantages of the Storage of Water. Discusses sedimentation, decolorization, equalization, destruction of bacteria, temperature, plankton, etc. By Melville C. Whipple. 3,000 words. Fire & Water Engineering, August 7. 15 cts.

Protect Water-Supply Creek from Pollution and Ice. Hydro-chronographs in concrete houses measure portions diverted to different high level districts. 3 ills., 600 words. Engineering News-Record, August 29. 20 cts.

The Control of Water Supplies. Discusses consumption, safety and quality. By H. W. Clark. 2,000 words. Fire & Water Engineering, August 21. 15 cts.

Dams:

The Mountain Dell Multiple Arch Reinforced Concrete Dam of Salt Lake City. Dimensions and other details. 1 ill., 400 words. Engineering and Contracting, August 14. 15 cts.

Facing Leaky Rock Fill Dam with Timber Planks. After dam was raised 25 feet old concrete facing leaked, so three rows of creosoted boards were placed on face. By George M. Bull, consulting civil engineer, Denver, Colo. 2 ills., 2,100 words. Engineering News-Record, August 1. 20 cts.

Wells:

Special Cast Iron Lining of Two Large Bore Wells. 38-inch to 20-inch well with cast iron lining sunk by English engineer. By W. H. Maxwell. 2 ills., 2,700 words. Engineering and Contracting, August 24. 15 cts.

Grouting Wells in Rock Formation Effective and Simple. Water protected from contamination, head saved, casing protected; general principles stated, examples and cost. By W. G. Kirchoffer, hydraulic and sanitary engr., Madison, Wis. 1 ill., 1,400 words. Engineering News-Record, August 22. 20 cts.

Piezometers and Current Meters Used to Test Wells. Flow records obtained and leaky casings located as part of water conservation program at Honolulu. By R. D. Klise, asst. engr., Division of Hydrography, Territory of Hawaii, Honolulu. 1 ill., 1,300 words. Engineering News-Record, August 29. 20 cts.

Pumping:

Butte Water Company's New Electric Pumping Unit in Service. A motor-driven 5-stage centrifugal pump delivers 6,000,000 gallons per day, original units being held in reserve. 400 words. Electrical Review, August 31. 30 cts.

Improving Pumping Station Grounds. How Lewiston, Idaho, is making its pumping station attractive. By E. G. Wagner. 4 ills., 1,000 words. Municipal Journal, August 3. 10 cts.

NEWS OF THE SOCIETIES

Sept. 17-20.—PACIFIC COAST ASSOCIATION OF FIRE CHIEFS. Annual convention, Oakland, Cal. Secretary, chief Harry W. Bringhorst, Seattle, Wash.

Sept. 24-27.—INTERNATIONAL ASSOSOCIATION OF MUNICIPAL ELECTRICIANS. Annual convention, Atlanta, Ga. Secretary, Clarence R. George, Houston, Tex.

Sept. 25-26.—AMERICAN WATER WORKS ASSOCIATION, Central States Division. Annual convention, Pittsburgh, Pa. Secretary, R. F. Bricker, Shelby, O.

Oct. 2-4.—AMERICAN SOCIETY OF MUNICIPAL IMPROVEMENTS. Annual meeting, Buffalo, N. Y. Secretary, Charles Carroll Brown, 304 E. Walnut St., Bloomington, Ill.

Oct. 7-9.—AMERICAN ASSOCIATION OF STATE HIGHWAY OFFICIALS. Annual meeting, Chicago, Ill. Acting secretary, A. D. Williams, Morgantown, W. Va.

Oct. 14-17.—AMERICAN PUBLIC HEALTH ASSOCIATION. Annual meeting, Boston, Mass. Secretary, 126 Massachusetts Ave., Boston, Mass.

Oct. 17-19.—KANSAS PUBLIC SERVICE ASSOCIATION. Annual convention, Kansas City, Kan. Secretary, W. W. Austin, Cottonwood Falls, Kan.

Nov. 6-8.—CITY MANAGERS' ASSOCIATION. Fifth annual convention, Roanoke, Va. Secretary, H. G. Otis, city manager, Auburn, Me.

Nov. 14-15.—WASHINGTON STATE GOOD ROADS ASSOCIATION. Annual convention, Pasco, Wash. Secretary, Clancey M. Lewis, Seattle, Wash.

American Society of Municipal Improvements.

The twenty-fifth jubilee convention of the American Society of Municipal Improvements will be held in Buffalo, N. Y., October 2, 3 and 4. The convention headquarters will be at the Hotel Iroquois. Mayor George S. Buck of Buffalo has issued a cordial invitation to all members, and a bulletin gives an imposing list of municipal improvements of interest in the convention city.

It will be strictly a war-time convention, restricted to two days actual work and with limited entertainment. Special arrangements will be made for a trip to Niagara Falls if a sufficient number care to stay over Saturday.

American Public Health Association.

The following tentative program has been prepared for the forty-sixth annual convention of the American Public Health Association to be held in Chicago, with headquarters at the Hotel Morrison, Oct. 14-17.

The program of the general session is as follows: Presidential address, Charles J. Hastings, M. D., Toronto, Ont.; "Team-play for Public Health," George E. Vincent, president of the Rockefeller Foundation, New York City; Address (subject to be announced), W. C. Gorgas, Surgeon-General, U. S. A.; "Preservation of the Health of the Civil Population during the War," Victor C. Vaughan, Colonel, Medical Corps, N. A.; "Some Public Health Problems and Opportunities Created by the War," William H. Welch, Major, Medical Corps, N. A.; "The Accomplishments of Public Health—Statistical and Historical Evidence," Dr. Frederick L. Hoffman, statistician, Prudential Life Insurance Co., Newark, N. J.; "War-Time Importance of Narcotic Drug Addiction," Ernest S. Bishop, professor of clinical medicine, New York University and Bellevue Hospital Medical College, New York City; "The Future of the American Public Health Association," Dr. Leo K. Frankel, treasurer American Public Health Association, New York City; "Reorganization of The American Public Health Association," W. A. Evans, M. D., Chicago, Ill.

The program of the Public Health Administration Section will be as follows: "War and Conservation of Child Life," S. Josephine Baker, M. D., department of health, New York City; "Scoring of Health Activities in Cities," Paul B. Brooks, M. D., state health department, Albany, New York; "Rural Sanitary Privies," Warren H. Booker, state board of health, Raleigh, N. C.; "Fashions as Affecting Public Health," Jeanette Throckmorton, Chariton, Ia.; "Taking the Board of Health to the People," Dr. B. L. Arms, chief bacteriologist, state board of health, Jacksonville, Fla.; "War Program of The Federal Children's Bureau," speaker to be announced later; "Venereal Diseases," Dr. John Dill Robertson, health commissioner, Chicago, Ill.; "Vaccination as a War Measure," Dr. Maurice Ostheimer, department of health, Philadelphia, Pa., and "A Plea for a Public Health Magazine," by Dr. B. Liber, New York City, also "A joint session with the Laboratory Section." (See Laboratory Section program.) "Round Table Discussion of Unusual Experiences," by twenty health officers. Committee reports on "National Program of Prenatal Care," "Standard Regulations for the Control of Communicable Diseases," "Standardization of the Work of Public Health Officials," "Rural Health Administration," "Venereal Diseases."

The program of the Sociological Section will include a round table discussion on the general subject "What is the effect of the high cost of living on public health?" The speakers will be John Dill Robertson, M. D., Commissioner of Health, Chicago, Ill.; Louis Harris, M. D., Director Bureau of Preventable Diseases, N. Y., N. Y.; E. R. Kelly, M. D., State Commissioner of Health, Boston, Mass. On the subject, "What is the relation of wages to public health?" B. S. Warren, Assistant Surgeon-General, Public Health Service, Washington, D. C., will speak. Arthur E. Holder, Member Federal Board for Vocational Education, Wash., D. C., will speak on the same theme as viewed by labor. Miss Julia Lathrop, Director Federal Children's Bureau, Wash., D. C., will speak on "The relation of wages to infant mortality." On "How may hospital and dispensary organizations be reconstructed for increased social efficiency?": "Group Medicine," by Michael M. Davis, Jr., Ph. D., Director Boston Dispensary, Boston, Mass.; "Corpora-

(*Continued on page 221*)

PROBLEMS CITIES ARE STUDYING WITH EXPERTS

Winnsboro, La., is to build SEWERS, WATERWORKS and SIDEWALKS, to cost about $80,000. The engineer for the work is Xavier A. Kramer.

Cumberland County, Me., is to repair a BRIDGE at South Portland. The consulting engineers for the work are the firm of J. R. Worcester & Co.

Dorranceton, Pa., is to make PAVING IMPROVEMENTS, plans being in course of preparation by the engineering firm of Young & Wintermute.

Cochise County, Tombstone, Ariz., is to improve 22 miles of ROADS and construct BRIDGES and CULVERTS. The engineer for the work is J. C. Ryan.

Two VIADUCTS are to be built at Glencoe, Ill. Plans for the structures have been completed by the consulting engineering firm of Windes & Marsh.

A SANITARY SEWER SYSTEM is to be built by Pensauken, N. J. New plans for the improvement are being prepared by the consulting engineering firm of Remington & Vosbury.

Manson, Ia., is to build SEWERS and a DISPOSAL PLANT. Plans are nearing completion by the consulting engineer, C. H. Currie.

Wheeler County, Wheeler, Tex., is to build about 28 miles of ROAD according to plans prepared by the engineering firm of Hess & Skinner.

In constructing HIGHWAYS, Santa Fe county, Santa Fe, N. M., has the engineering services of J. A. Whittaker.

A SEWERAGE SYSTEM and DISPOSAL PLANT are to be built by Newark, O. The consulting engineers for the improvements are the firm of Bradbury & Barbour.

A CONCRETE BRIDGE to cost $25,000 is to be built at Winfield, Kans. The consulting engineering firm of Harrington, Howard & Ash has completed the plans for the structure.

Ray County, Orrick, Mo., is to build a DRAINAGE SYSTEM to cost about $20,000. The Clarke E. Jacoby Engineering Co. prepared plans for the work.

NEW APPLIANCES

Describing New Machinery, Apparatus, Materials and Methods and Recent Interesting Installations.

ELECTRIC SIREN.

Federal Alarm Signal With Important Advantages.

Ease of operation, reliability, low cost of installation and maintenance and general effectiveness are the principal advantages claimed for the Federal electric siren, which is used for calling volunteer fire departments, announcing emergencies, summoning home defense league members and reserves and for similar purposes in public buildings, factories, etc. The requirements for such signalling are essentially distinctiveness, range and speed, and in these electric operation has decided advantages over other methods.

The electric siren has a distinctive note, which is so peculiar that response is automatic. It sounds out clear above other noises and cannot be confused with any other tone like that of a steam or air whistle, bell or gong. Its sound is penetrating and covers a wide area. Immediacy of call, obviously necessary in case of emergency, is considerably hastened by electric operation. The siren is really anywhere where there is a button because it may be controlled from a distance. The electric siren does not require time to get going and it does not require a rest, as may be necessary in the case of compressed air. It may be operated from telephone office, central fire station, city hall, waterworks, power house or any similar location day or night. It may be sounded from any number of remote points by the use of a special remote control device, consisting of two momentary contact push button switches. This important feature makes it particularly serviceable for signalling in such places as isolated public works covering some area, such as water and power plants and reservoirs, sewage disposal plants, storage yards, parks and in camps, cantonments, etc.

Where there is no plant using steam the cost of steam installation or of a compressed air outfit would be prohibitive compared with that of the siren. The cost of a good-sized bell of any effectiveness would be greater than that of the electrical equipment. Operating cost of the siren is almost negligible. Even if the siren were blown continuously for a period of 300 minutes, or intermittently two hundred times a year, the cost of current would be only about one dollar. Maintenance costs are similarly trifling as the outfit requires oiling but three or four times a year. It requires no care at all and does not need a night and day watch like more elaborate installations. There are no risks of tank explosions or leaky pipes and other troubles.

The federal siren is made in three main types and sizes, and may be had for either alternating or direct current. The sirens are constructed for outdoor service, every part being thoroughly enclosed and absolutely damp and weather proof. The motors are entirely covered by a heavy galvanized sheet iron head. The motor is made from aluminum, cast in one piece; while the outside stator or horn is made of heavy cast iron. The base is also cast iron. The type "B" double-head siren is used in small towns and villages, while the type "B" single head is used in installations of smaller range. The smallest size—"A"—made for both interior and exterior service, is in the form of a "horn." It may be used in public buildings, factories, storehouses, etc., and also as traffic signals and warnings at street corners, railway intersections, etc. It may also be used on fire-boats, piers, docks, bridges, etc. The single-head type sounds over a radius of ¾ mile, while the double-head type covers twice that radius. Type A operates at 7,000 r.p.m. and the others at 3,500.

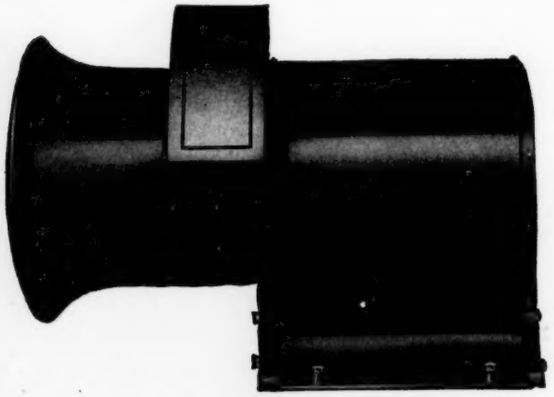
The accompanying illustrations show the three types. These sirens are made by the Federal Sign System (Electric), Lake and Desplaines streets, Chicago, Ill.

FEDERAL TYPE A HORN SIREN.

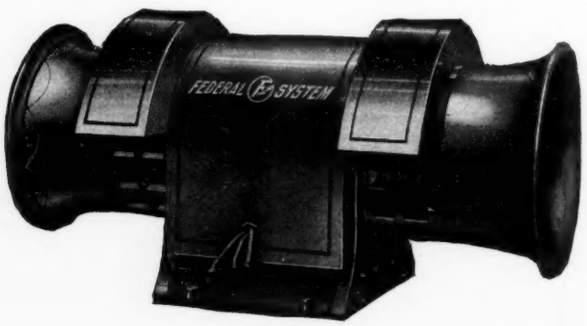
INDUSTRIAL NEWS

Plans to Increase Steel Output.

At a meeting of the War Industries Board, presided over by Bernard M. Baruch, the chairman, and attended by Dr. Harry A. Garfield, the Fuel Administrator; Carl Gray, representing the Railroad Administration; Felix Frankfurter, representing the Department of Labor; the war service committee of the Iron and Steel Institute, and other steel manufacturers and Government officials, the whole question of the Government's steel requirements was taken under review with a view to meeting every ounce of the actual demand, if that be possible.



SINGLE-HEAD SIREN.



DOUBLE-HEAD SIREN.

The steel manufacturers were under the presidency of James A. Farrell, of the United States Steel Corporation, and included E. G. Grace, of the Bethlehem Steel Corporation; A. C. Dinkey, of the Midvale Steel & Ordnance Co.; John A. Topping, of the Republic Iron & Steel Co., and others.

The largest of the Government's steel requirements is that of the railroads; next, that of shipbuilders; third, the War Department; and fourth, the Navy. The question of supplying these demands in such fashion that there need be no curtailment of the actual war requirement for steel was put squarely before the manufacturers and all others concerned in any way with steel production.

To accomplish this it was decided that there must be:

First, greater conversion of mills to the production of steel that is required in the war program.

Second, an increase in the coal supply, particularly by-product coal, available for mills engaged on Government work.

Third, shutting off further steel shipments to industries other than those engaged in meeting war needs.

Fourth, more rigorous conservation in the handling of steel in the mills.

The steel men in the meeting promised to co-operate to their utmost in meeting the Government's steel requirements and virtually pledged themselves to so increase their output as to guarantee the needs of the war.

Cast Iron Pipe.—While the pig iron supply for pipe manufacturers is not adequate, there is promise of improvement with government cooperation. Plants are, however, maintaining reasonably high production, especally of pipe used in the government's housing and cantonment developments for which pig iron is assured by the War Industries Board. Quotations: Chicago: 4-inch, $64.80; 6-inch and larger, $61.80; Class A, $1 extra. New York: 4-inch, $64.75; 6-inch and larger, $61.75; Class A, $1 extra.

NEWS OF THE SOCIETIES

(*Continued from page* 219)

tion Hospitals and Dispensaries," Harry E. Mock, Lieut.-Colonel M. R. C., Wash., D. C.; "Hospital and Dispensary Organizations," R. A. Bolt, M. D., Chief of Bureau Child Hygiene, Dept. of Public Welfare, Div. of Health, Cleveland, Ohio. On the subject, "What adjustment in health administration must be made as a result of war conditions?": "Venereal Diseases," by Wm. F. Snow, Major, M. R. C., Wash., D. C.; "Tuberculosis," by Donald B Armstrong, M. D., Framingham, Mass.; "Industrial Accidents and Diseases," by Emery R. Hayhurst, M. D., Consultant, Div. of Industrial Hygiene, Ohio State Dept. of Health, Columbus, Ohio.

The program of the section on industrial hygiene will include, first session, "The Problems of Industrial Hygiene." George M. Price, M. D., N. Y., will speak on that topic. Dr. Fred. M. Hoffman of Newark, N. J., on "The Problem of Organic Dust in Modern Industries"; J. W. Schereschewsky, M. D., Wash., D. C., on "The Problem of Industrial Poisons"; Fred. Lee, M. D., N. Y., N. Y., on "The Problem of Industrial Fatigue"; Fred. L. Van Sickle, M. D., Olyphant, Pa., on "The Problem on Compensation for Industrial Disease"; Elizabeth B. Bricker, M. D., Harrisburg, Pa., on "The Problem of Women in Industry."

The second session, on the problems of the war industries, will include talks on "The Explosives Industry," by W. G. Hudson, M. D., Wilmington, Del.; "The Textile Industry," by A. J. Lanza, M. D., Pittsburgh, Pa.; "The Dye Industry," by Alice Hamilton, M. D., Chicago, Ill.; "The Steel Industry," by Loyal A. Shoudy, M. D., Bethlehem, Pa.; "The Shipbuilding Industry," by Lieut.-Col. Philip S. Doane, Phila, Pa.

The third session on industrial hygiene in relation to the efficiency of the worker, will include talks on "Housing," by Royal Meeker, M. D., Wash., D. C.; "Lighting," by Prof. C. C. Clewell, Phila., Pa.; "The Clinic for Vocational Diseases," by Louis I. Harris, M. D., N. Y.; "Industrial Medicine and Surgery in Relation to War and Production," by Otto P. Geier, M. D., Cincinnatti, O.

The program of the section on vital statistics will include, in its first session, talks on "An Inquiry into the Reliability of Causes of Death," by Louis I. Dublin, Ph. D., and Geo. H. Van Buren. There will follow reports of committees on "Institutional and Hospital Statistics," by Fred. L. Hoffman, Ph. D., chairman; and on "Morbidity Reports and Statistics," by A. J. Chesley, M. D., chairman; "Accuracy of Certified Causes of Death and Its Relation to Mortality Statistics and the International List," Haven Emerson, M. D., chairman; "Legislation," Charles V. Chapin, M. D., chairman.

At the second session: "Report of Committee on Morbidity Records and Mortality Statistics in Industry," Louis I. Dublin, Ph. D., chairman; "Difficulties Encountered in Allocating Nonresident Deaths in the State of New York," Otto R. Eichel, M. D.; "Relation of Vital Statistics to Public Health Administration," Wm. F. Petrie; "Collection of Birth Records in Thinly Settled Communities," L. W. Feezer; Report of the Committee on Amendmends to the Standard Certificate of Birth, William H. Davis, M. D., chairman.

At the third session: "The Pioneer Registration State of the West," Wm. F. Petrie; "Report of the Committee on Registration Affairs," William H. Davis, M. D., chairman; "Report of the Committee on the 1920 Census and its Relation to Vital Statistics," Wm. H. Guilfoy, M. D., chairman; "Family Statistics from Registration Sources," Edwin W. Kopf; "Cooperation of State and Federal Governments in the Registration of Births and Deaths," Jno. Emerson Monger, M. D.; "Bird Registration in Connecticut," James P. Bilfe.

At the fourth session: Report of Section Council and Nomination of Standing Committees for Ensuing Year; "The Toll of the Degenerative Diseases. A Plan for its Reduction," E. B. Fink, Chicago, Ill.; "Nine Months of Infant Mortality in the United States During War," Frederick S. Crum, Ph. D.; "Report of the Committee on Forms and Methods of Statistical Practice," Walter F. Willcox, Ph. D., chairman; "Report of the Committee on Nonresident Deaths," W. R. Batt, M. D., chairman; "Report of the Committee on Resolutions," Wm. F. Guilfoy, M. D., chairman; Unfinished Business.

The first session of the Food and Drug Section will deal with General Considerations on War-time Foods. Address of chairman: "The Food Supply of the United States after a Year of War."

The program of the second session will include the general subject, the civilian's foods in war time. There will be reports of committees on "Preparation, Packing, and Transportation of Foods"; "Relation of Foods to Disease"; and "Retail Distribution and Marketing." The particular subjects to be considered are the following: "A Year's Changes in Food Habits"; "Meats—The Present Aspect of Supply, Conservation, and Development"; and "The Interrelation of Controls of Quantity and Purity of Foods and the Irreducible Minima of the Latter in War-Time."

The program of the third session will include the general subject, the soldier's food. There will be reports of committees on "Canning," "Cold Storage," and "Meat Inspection." The particular subjects to be considered are the following: "Price Control of Foods. Why is it Justified?"; "The Supply of Pharmaceuticals in War-Time; Importance and Dangers"; "Legitimate Uses of Narcotics in War-Time"; and "Two War Jokers in Narcotics."

The program of the sanitary engineering section will include the reports of Prof. F. H. Bass, Minneapolis, of the Committee on "Air Supplies"; F. F. Longley, N. Y., on "Water Supplies" and Frank A. Barbam, Boston, on "Sewerage and Sewage Disposal"; "Sanitary Control of Waterways," H. P. Eddy, Boston, Mass., chairman; "Refuse Collection and Disposal," Samuel A. Greeley, Chicago, chairman; "Street Cleaning," James W. Paxton, Washington, D. C., chairman; "Constitution," Samuel A. Greeley, Chicago, chairman; "Works Operation and Analytical Methods," Chas. B. Hoover, Columbus, O., chairman; "Plumbing and Drainage of Buildings," no chairman; "Milk Pasteurization," H. A. Whittaker, state sanitary engineer, Minneapolis, Minn., chairman.

The following papers will be presented. "The Work of the Department of Health and Sanitation of the U. S.

Shipping Board," Lieutenant-Colonel P. S. Doane, Philadelphia, Pa.; "The Sewage Treatment Problem in Chicago," C. D. Hill, Engineer, Board of Local Improvements, Chicago, Ill.; "Dissolved Oxygen as an Index of Pollution of New York Harbor," Kenneth Allen, New York City; "The Recognition Given the Sanitary Engineering Work in the Government War Activities," George W. Fuller, New York City; "The Chlorination of the Chicago Water Supply," John Erickson, Chicago, Ill.; "Chemical Control of Water Chlorination," W. J. Allen; "Garbage Improvement at Louisville," Samuel A. Greeley, Chicago, Ill.

MUNICIPAL INDEX

(*Continued from page* 218)

Construction:

Trenching Machinery in Laying Water Pipe. Experience of Freeport, Illinois, in the use of a trenching machine, tamping machine and leadite. 700 words. Municipal Journal, August 24. 10 cts.

Laying Water Mains in Detroit. Figures as to cost, amount laid, etc., in 1917. 500 words. Municipal Journal, August 3. 10 cts.

New Concrete Pipe Joint Designed for High Pressure. Under tests proves water-tight for heads up to 250 feet; can be used for diameters as small as four inches. 1 ill., 600 words. Engineering News-Record, August 1. 20 cts.

Operation:

Water Works Operation. Measuring the water entering a test section by means of Deacon meter, pitometer and other methods. 1 ill., 2,500 words. Municipal Journal, August 3. 10 cts.

Water Works Operation. Desirability of emergency gang and the appliances that enter into a complete emergency outfit. 1,800 words. Municipal Journal, August 17. 10 cts.

Water Works Operation. Service connections with appurtenances and the purposes served by each. 1,600 words. Municipal Journal, August 24. 10 cts.

Water Works Operation. Discussion of relative advantages of galvanized, lead, lead-lined and cement-lined service pipes. 1 ill., 2,300 words. Municipal Journal, August 31. 10 cts.

Thawing Services with Hot Water and with Electric Outfit. Experiences at Milton, Mass., last winter. 1,300 words. Engineering and Contracting, August 14. 15 cts.

Locating Leaks in Ottawa. Description of a pitometer survey for this purpose in 1917. 500 words. Municipal Journal, August 3. 10 cts.

Location Methods for Water Works Distribution System at Newton, Mass. Method of locating services, gates, etc. By Edwin H. Rogers. 2 ills., 700 words. Engineering and Contracting, August 14. 15 cts.

Construction of Famous Aqueduct Facilitated by Electricity. Use of motor-operated machinery effects considerable saving in construction costs, as well as speeding operations. By C. W. Geiger. 5 ills., 1,400 words. Electrical Review, August 17. 15 cts.

Miscellaneous:

War Burdens of Water Works of United States Increase. From a report to the Executive Committee of the American Water Works Association made by Leonard Metcalf, George A. Johnson and George W. Fuller. 8 ills., 2,700 words. Engineering News-Record, August 15. 20 cts.

Report of A. W. W. A. Committee on War Burdens of Water Works of the U. S. Excerpts from report. 3 ills., 2,700 words. Fire & Water Engineering, August 14. 15 cts.

Reducing Water Waste to Save Coal. Data relative to New York cities and suggestions as to how such wastes can be reduced. 1,800 words. Municipal Journal, August 17. 10 cts.

Fully Metered Plant Treats Highly Turbid Arkansas for Tulsa. Venturi meters of new type supply and control dry chemical feeders; weighted swing gates equalize resistance in mixers. 5 ills., 2,000 words. Engineering News-Record, August 1. 20 cts.

Water Company Wins Imperial Valley Seepage Case. Court holds raising of water table and damage in land adjoining canal in sand not chargeable to irrigation company. 1,200 words. Engineering News-Record, August 1. 20 cts.

Unit Costs for Setting Water Meters. By Allen F. Brewer, Merion, Pa., lately asst. valuation engr., New Jersey Utility Com. 1 ill., 300 words. Engineering News-Record, August 22. 20 cts.

The Rehabilitation of a City Water Supply Under Municipal Ownership. The history of the water supply of Pocatello, Idaho. By E. S. Anderson. 3 ills., 1,600 words. The American City, August. 40 cts.

The New Water Supply System of New York. General history and description of the supply and the method of constructing the system. By Alfred D. Flynn, chief engr. Bd. of Water Supply. 7 ills., 6,000 words. The Modern City, August. 40 cts.

Annual Report of the Water Department of Haverhill. Abstract of the 26th annual report. 1,200 words. Fire & Water Engineering, August 14. 15 cts.

FIRE DEPARTMENTS.

Fire Prevention:

Notes on Fire Prevention. Resume of discussions at meeting of the Philadelphia Safety Council. By H. P. Weaver. 1,500 words. Safety Engineering, August. 30 cts.

Guarding Against Household Hazards. Suggestions for preventing fires in dwellings. 2 ills., 2,500 words. Fire Protection, August. 20 cts.

Spontaneous Combustion in Soft Coal Piles. Paper before National Firemen's Association. By W. L. Abbott. 4,500 words. The Fire Engineer, August. 15 cts.

Fire Departments:

Fire Departments in American Cities. Figures from recent bulletin by the Census Bureau. 14,000 words. Safety Engineering, August. 30 cts.

Fire Departments in American Cities. Figures from a recent report of the Census Bureau. 1,600 words. Fire & Water Engineering, August 28. 15 cts.

Annual Report of the Fire Department of Los Angeles. 1,000 words. Fire & Water Engineering, August 7. 15 cts.

Annual Report of the Fire Department of Waltham. Abstract of report of Waltham, Mass. 1,000 words. Fire & Water Engineering. August 21. 15 cts.

Annual Report of the Fire Department of Norwich. Abstract of report of Norwich, Conn. 1,200 words. Fire & Water Engineering, August 28. 15 cts.

Fire Fighting:

Fire Fighting by High Pressure. Practical suggestions for fire department. 3,500 words. The Fire Engineer, August. 15 cts.

GOVERNMENT AND FINANCE.

Kalamazoo Tries Proportional Representation. Narrative of inauguration and result of the experiment. By Augustus R. Happon. 4,500 words. Texas Municipalities, July. 25 cts.

San Diego's Purchasing Bureau. Work done during 1917. 400 words. Municipal Journal, August 24. 10 cts.

City Budgets. Editorial comment on the preparation of them. 500 words. Municipal Journal, August 3. 10 cts.

Advantages of the Executive Budget. Set forth by a bulletin of the Los Angeles Chamber of Commerce. 600 words. Municipal Journal, August 3. 10 cts.

Franchises and Public Utilities. Paper before League of Minnesota Municipalities. By Thomas Van Lear. 3,000 words. Minnesota Municipalities, August. 30 cts.

Housing:

Housing Shortage in Canada. Some special aspects, including provision for returned soldiers. By Thomas Adams. 1,600 words. Canadian Municipal Journal, August. 30 cts.

How the Housing Problem Is Solved In South Africa. Bloemfontein's housing scheme described by the town clerk. 14,000 words. Canadian Municipal Journal, August. 30 cts.

Yorkship Village for Ship Workers. A housing project near Camden, New Jersey, to provide permanent homes for 2,000 workers and their families. 1 ill., 1,400 words. Municipal Journal, August 3. 10 cts.

St. Louis New Zone Ordinance. Requirements for area districts, yards, courts, etc., and methods of enforcing the ordinance. 1,400 words. Municipal Journal, August 3. 10 cts.

MISCELLANEOUS.

Public Work:

Americans Build Sewer and Water Systems for Three Uruguayan Cities. Work requiring five shiploads of material 7,000 miles from the base of supplies completed year ahead of time; cement pipe manufactured on the ground. By Albert A. Northrop, Hog Island, Pa. 8 ills., 2,200 words. Engineering News-Record, August 29. 20 cts.

Street Work in Newport. Street watering, municipal quarry and other features of the work of 1917. 500 words. Municipal Journal, August 24. 10 cts.

Street and Sewer Work in Cincinnati. Unit costs and other details of work done in 1917. 800 words. Municipal Journal, August 24. 10 cts.

New Orleans Builds Inner Harbor and Navigation Canal. Rush construction with state funds to provide ocean docks and industrial sites on fixed level waterway between Mississippi River and Lake Pontchartrain. 3 ills., 2,000 words. Engineering News-Record, August 15. 20 cts.

Materials:

Relation of Stone Aggregate Content to the Compressive Strength of Concrete. Tests indicate that addition of twenty per cent of stone reduces strength of mortar by three per cent, while forty per cent of stone reduces it by eleven per cent; stone bears same relation to concrete as inert extenders bear to paint. By Capt. Llewellyn N. Edwards, supervising engr. of bridges, City of Toronto. 1 ill., 1,400 words. The Canadian Engineer, August 22. 15 cts.

Proportioning Concrete by Surface Areas of Aggregates. Tests tend to prove theory that concrete strength depends on relation of cement to total aggregate area. Abstract of paper before American Society for Testing Materials. 6 ills., 1,500 words. Engineering News-Record, August 15. 20 cts.

Street Lighting:

Annual Report of Lighting and Illumination Committee of the A. I. E. E. Review of year's progress in electric illumination. 600 words. Proceedings of the American Institute of Electrical Engineers, August. $1.10.

Lighting Curtailment. Objects and Methods to Be Kept in Mind. By Preston S. Millar. 2 ills., 18,000 words. Journal of the Engineers' Club of Philadelphia, August. 40 cts.

Street Cleaning and Refuse Disposal.

Cleaning Streets and Removing Garbage. Court decisions as to liability of municipalities for damage done in connection with such service. By John Simpson. 3,000 words. Municipal Journal. August 17. 10 cts.

Waste Disposal in Chicago. Amount of grease and tankage recovered from garbage, prices received, and improvements made in plant. 800 words. Municipal Journal, August 31. 10 cts.

The Pig as a Garbage Reduction Plant. Information prepared by the U. S. Food Administration for the aid of cities in their conservation policy. 4 ills., 3,600 words. The American City, August. 40 cts.

Public Service Utilities:

Automatic Rate System Is Fair to All. A year's experience with a service-at-cost franchise in Westerville, Ohio, shows desirability of flexible fares automatically adjusted. By Harold W. Clapp, gen'l supt. Columbus Railway, Power & Light Co., Columbus, O. 2,600 words. Electric Railway Journal, August 10. 15 cts.

Rising Rates. Discussion of increase in gas and electric rates of Minnesota municipalities. By Thomas Van Lear. 3,000 words. Minnesota Municipalities, August. 30 cts.

Fuel Saving:

Municipal Fuel Conservation. Practical suggestions as to how municipal officials can help in coal conservation, as in street lighting, pumping water, heating public buildings, etc. 5,000 words. Municipal Journal, August 31. 10 cts.

The Skip-Stop. Editorial discussing the increasing adoption of this plan for saving fuel. 500 words. Electrical Review, August 31. 30 cts.

The Co-ordination of Vital Statistics in Canada. Address before recent congress on vital statistics. By R. H. Coats. 2,300 words. Canadian Municipal Journal, August. 30 cts.

A National Duty of the Cities. Editorial advocating that cities keep a representative at Washington to represent their interests. 500 words. Municipal Journal, August 3. 10 cts.

Truck Owners' Conference. Announcement of conference to be held in Detroit September 19. 600 words. Municipal Journal, August 17. 10 cts.

ADVANCE CONTRACT NEWS

ADVANCE INFORMATION BIDS ASKED FOR

CONTRACTS AWARDED ITEMIZED PRICES

To be of value this matter must be printed in the number immediately following its receipt, which makes it impossible for us to verify it all. Our sources of information are believed to be reliable, but we cannot guarantee the correctness of all items. Parties in charge of proposed work are requested to send us information concerning it as early as possible; also correction of any errors discovered.

BIDS ASKED FOR

STATE	CITY	REC'D UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
			STREETS AND ROADS.	
O.,	Oberlin	noon, Sept. 14	Resurfacing two streets	E. G. Dick, Engr.
Ariz.,	Bisbee	Sept. 14	Grading two road sections	J. C. Ryan, Co. Hwy. Engr.
Ind.,	Muncie	10 a.m., Sept. 14	Constructing gravel or macadam road	F. M. Williams, Co. Aud.
Ariz.,	Tombstone	Sept. 14	Grading and paving 22.4 miles road with concrete 18 ft. wide	J. C. Ryan, Engr., Barnaby Bldg., Bisbee, Ariz.
Minn.,	Aitken	10 a.m., Sept. 14	Constructing 5.6 mi. of road	J. Wiebel, Town Clk.
Minn.,	Granite Falls	Sept. 15	Grading 3½ miles of road	State Highway Com., Guardian Life Bldg., St. Paul.
Ill.,	Chicago	1 p.m., Sept. 16	Improving road, involving 33,223 sq. yds. concrete pavement	L. D. Barker, Engr., Co. Bldg.
Ill.,	Benton	Sept. 16	Concrete roadway	C. B. Mautz, Co. Engr.
N. Mex.,	Santa Fe	Sept. 16	15.45 mi. state road construction, involving 4.182 mi. road grader work, 12,085 cu. yds. two-course crushed rock surfacing and 66,602 cu. yds. excavation	State Hwy. Com.
Minn.,	St. Paul	10.30 a.m., Sept. 16	Grading and improving a number of streets	H. W. Austin, Purch. Agent
Ia.,	Indianola	5 p.m., Sept. 16	Constructing sidewalks	E. M. Wilson, City Clk.
Wis.,	Beaver Dam	8 p.m., Sept. 16	Concrete sidewalks	Bd. of Pub. Wks.
Mich.,	East Grand Rapids	Sept. 17	Paving 1 mi. concrete, 10 ft. wide	H. Hugenholtz, City Clk.
Fla.,	Key West	Sept. 18	30,000 sq. yds. surface treatment	Harold Pinder, City Clerk.
Pa.,	Uniontown	Sept. 18	Resurfacing 6,741 ft. with bituminous concrete	H. Kisinger, County Cont.
Mich.,	St. Clair Hts.	8 p.m., Sept. 18	Paving on two streets	Village Engineer.
O.,	Cincinnati	noon, Sept. 20	Improving pike	Albert Reinhardt, Co. Clk.
Minn.,	Glencoe	2 p.m., Sept. 21	Constructing federal aid road 13.71 mi. long, involving 5.25 acres grubbing, 57,987 cu. yds, excavation, etc.	F. D. Stocking Co. Aud.
Minn.,	St. Peter	Sept. 21	Grading and graveling streets	M. E. Stone, City Clerk.
Tenn. and Va.,	Bristol	Sept. 23	Grading and paving with 20,000 sq. yds. concrete and asphalt	City Recorder, Bristol, Tenn., and City Clk., Bristol, Va.
Tenn.,	Bristol	Sept. 23	5,000 sq. yds. paving	City Recorder.
Va.,	Bristol	Sept. 23	6,000 sq. yds. paving	City Clerk.
Minn.,	Wabasha	2 p.m., Sept. 24	Constructing 13.96 mi. federal aid road, involving 87,089 cu. yds. excavation	John Boss, Co. Aud.
Ark.,	Harrisburg	Sept. 24	Constructing 16.7 mi. of road involving 96,800 yds. of grading	County Comrs.
O.,	Columbus	noon, Sept. 24	Concrete masonry retaining wall in connection with separation of street and railway grades	George A. Borden, Dir. of Pub. Serv.
Pa.,	Harrisburg	10 a.m., Sept. 25	Reconstructing 1,115 ft. either vitrified block pavement or bituminous concrete on concrete foundation, 20 to 34 ft. wide, Delaware Co.; 5,091 ft. one-course plain cement concrete pavement, 18 ft. wide, Westmoreland Co.	J. Denny O'Neil, State Highway Commissioner.
Va.,	Roanoke	Sept. 26	Granolithic curb and resurfacing with Bermudez asphalt	A. W. Morris, City Engr.
W. Va.,	Williamson	Sept. 26	Constructing 8 mi. earth road	A. Bishop, Pres. Bd. of County Comrs.
Minn.,	Winona	2 p.m., Sept. 26	Constructing 6.42 mi. federal aid road	State Hwy. Dept., St. Paul, Minn.
N. J.,	Trenton	10:30 a.m., Oct. 2	48,880 sq. yds. bituminous concrete surfacing (Warrenite) in Morris County and 48,580 sq. yds. concrete surfacing in Cape May Co.	State Hwy. Comn.
			SEWERAGE.	
Minn.,	Trommald	8 p.m., Sept. 14	6,280 ft. 12-inch water and sewer pipe	R. G. Harte, Village Clerk.
Ia.,	Belle Plaine	8 p.m., Sept. 16	1,621 ft. 8-in. vitrified sanitary pipe sewer and manholes	E. M. Ewen, City Clk.
Minn.,	St. Paul	10.30 a.m., Sept. 16	Constructing sewer	H. W. Austin, Purch. Agent
Mont.,	Wolf Point	Sept. 16	Constructing sewer, manholes and flush tanks	C. P. Wells, Engr., Great Falls, Mont.
N. J.,	Camden	Sept. 16	Reconstructing brick sewer to cost about $15,000	F. S. Van Hart, City Hall.
Wis.,	Beloit	2 p.m., Sept. 16	Storm sewer construction, involving 12 to 18-in. pipe	Bd. of Pub. Wks.
Ia.,	Davenport	2 p.m., Sept. 17	Reinforced concrete box sewer, 6x10 ft.	J. W. Crowley, Comrs. of Pub. Wks.
Va.,	Roanoke	noon, Sept. 17	Sewer construction	A. Ward Morris, City Engr.
Mo.,	Caruthersville	2 p.m., Sept. 17	Drainage ditch construction	Elliot & Harman, Engr. Com., Peoria, Ill.
O.,	Troy	Sept. 18	Constructing sanitary sewer	R. Hennessey, City Clk.
Mass.,	Boston	Sept. 19	Constructing sewers involving 450 ft. 20 to 24-in. sewer pipe, 600 ft. 6½-ft. concrete pipe, 1,200 ft. 2½-ft. concrete pipe or segment block, to cost about $60,000	E. F. Murphy, City Engr.
Minn.,	Windom	1 p.m., Sept. 19	Drainage ditch construction, involving 6 to 20-in. tile	C. W. Gove, Engr.
Minn.,	Fairmont	8 p.m., Sept. 19	Constructing about 6,800 ft. 18-in. sewer; constructing sewage disposal plant consisting of Imhoff tank and sludge drying beds with connecting pipes and 18-in. vitrified clay sewer pipe outlet	E. L. Lewis, City Clk.
Mo.,	Macon	8 p.m., Sept. 24	Constructing sewage disposal works including Imhoff tank, sludge bed, storm overflow, about 790 ft. 18-in. sewer; straightening creek channel	W. H. Martin, City Clerk.
Okla.,	Okmulgee	Sept. 25	Constructing sewage disposal plant	Burns & McDonnell, Engrs., 400 Interstate Bldg., Kansas City, Mo.

BIDS ASKED FOR

STATE	CITY	REC'D UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
Ill.,	Chicago	noon, Sept. 26.	Constructing and equipping sewage pumping station, involving building of concrete, stone and brick, 76.5x31 ft., with suction and discharge chambers, 5-ton hand crane and accessories, excavation, surfacing and miscellaneous work; pumping machinery, including three 30-in. centrifugal pumps, three 14-in. centrifugal pumps and all necessary valves and appurtenances, and a number of additional units; electrical equipment, including six 100-kva. transformers, three 100-hp. induction motors, three 25-hp. induction motors (vertical type), two 5-kva. transformers, oil switch equipment and miscellaneous; switchboard, conduit and wiring	John McGilien, Clerk Sanitary Dist. of Chicago, 910 South Michigan Ave.

WATER SUPPLY.

Minn.,	Trommald	8 p.m., Sept. 14.	Furnishing and installing water pipe	R. D. Harte, Vil. Clk.
Wash.,	Seattle	10 a.m., Sept. 14.	Constructing water mains, hydrants and appurtenances	City Engineer.
Va.,	Alexandria	Sept. 15.	2,000,000-gallon filtration plant to cost about $130,000	D. J. Howell & Son, Engrs., Union Trust Bldg., Washington, D. C.
Ill.,	Allenhurst	8 p.m., Sept. 16.	Drilling and constructing well	City Clerk.
Mont.,	Wolf Point	Sept. 16.	Constructing water mains, hydrants and valves	C. P. Wells, Engr., Great Falls.
N. Y.,	New York	11 a.m., Sept. 16.	Hauling and laying water mains and appurtenances	Nicholas J. Hayes, Comr. of Water Supply, Gas & Elect.
Cal.,	Coalinga	Sept. 16.	Furnishing engine, pump and motor for auxiliary pumping plant	F. G. Dessery, Central Bldg., Los Angeles, Engr.
N. J.,	Cape May	Sept. 16.	Water supply system (spec. No. 3386)	Bureau Yards & Docks, Navy Dept., Washington, D. C.
S. D.,	Carthage	1 p.m., Sept. 17.	Wrecking present wooden tank on 75-ft. steel tower and constructing 50,000-gal. steel tank on 100-ft. steel tower, either elliptical or hemispherical bottom, or 50,000-gal. reinforced concrete tank on 90-ft. reinforced concrete tower	J. F. Druar, Cons. Engr., 314 Commercial Bldg., St. Paul, Minn.
Okla.,	Tulsa	Sept. 20.	Making survey for ascertaining water supply	C. H. Hubbard, Mayor.
Can.,	Ottawa	3 p.m., Sept. 24.	Furnishing water meters	A. F. Macallum, Comr. of Wks.
Okla.,	Okmulgee	Sept. 25.	Constructing waterworks	Burns & McDonnell, Engrs., 400 Interstate Bldg., Kansas City, Mo.

LIGHTING AND POWER.

N. J.,	Cape May	Sept. 16.	Heating and electrical systems	Bureau Yards & Docks, Navy Dept., Washington, D. C.
O.,	Columbus	noon, Sept. 16.	25 amp., 200 volts, 60 cycle, 3 wire, single phase, watthour meter; 400 amp., 200 volt, 60 cycle, polyphase, watthour meter with current transformer; 25 amp., 50 amp., 75 amp. and 100 amp., 400 volt, 60 cycle, polyphase, watthour meter	George A. Borden, Pres. Bd. of Purch.
O.,	Columbus	noon, Sept. 16.	5,000 lbs. No. 6 T. B. W. P. solid copper wire and 1,100 lbs. C. N. T. B. W. T. stranded copper wire	George A. Borden, Pres. Bd. of Purch.
Colo.,	Denver	2 p.m., Oct. 1.	Furnishing 5,000-kw. vertical hydraulic turbine and generator	U. S. Reclamation Service, Washington, D. C.
Ida.,	Minidoka	Oct. 1.	Constructing power plant extension and furnishing hydraulic turbine and generator	U. S. Reclamation Serv., Dept. of Interior, Denver, Colo.

BRIDGES.

Ariz.,	Bisbee	Sept. 14.	Constructing bridges and culverts	J. C. Ryan, Co. Hwy. Engr.
Ariz.,	Tombstone	Sept. 14.	Constructing bridges and culverts	J. C. Ryan, Engr., Barnaby Bldg., Bisbee, Ariz.
Ill.,	Chicago	1 p.m., Sept. 16.	Bridges and culverts	L. D. Barker, Co. Engr.
N. Mex.,	Santa Fe	Sept. 16.	120-ft. steel span bridge, four 31-ft., six 21-ft. and 2,630 lin. ft. corrugated iron culvert; 350 cu. yds. concrete head walls; retaining walls	State Highway Com.
Mont.,	Great Falls	noon, Sept. 16.	Constructing reinforced arch bridge, about 1,200 ft. long, 29.6 ft. roadway and 7-ft. sidewalk	John E. Moran County Clerk
O.,	Canton	10 a.m., Sept. 16.	Reconstructing bridge	W. C. Schick, Co. Clk.
Mont.,	Great Falls	noon, Sept. 16.	Constructing reinforced concrete arch bridge, 970 ft. long, 42-ft. roadway and two 8-ft. sidewalks	John E. Moran, Co. Clk.
Neb.,	Lincoln	2 p.m., Sept. 16.	Constructing bridge	S. B. Hohman, Sec. San. Dist. No. 1, Lancaster Co.
Va.,	Lawrenceville	Sept. 16.	Constructing several steel bridges, 175, 20, 23, 23, 37, 70 and 84 ft. long	A. Glidden, State Hwy. Engr., Richmond, Va.
Va.,	Richmond	Sept. 16.	7 reinforced concrete and steel bridges, to cost about $100,000	G. P. Coleman, State Hwy Com.
Minn.,	Granite Falls	Sept. 17.	Constructing bridge	K. P. Caswell, Assc. Engr.
Minn.,	Glencoe	2 p.m., Sept. 21.	Concrete culverts	F. D. Stocking Co. Aud.
Minn.,	Wabasha	2 p.m., Sept. 24.	Concrete culvert material, 12 to 26 inch, and 10 reinforced concrete culverts	John Boss, Co. Aud.
O.,	Massillon	10 a.m., Sept. 16.	Constructing bridge	J. L. Sickafoose, Engr., Canton, O.
Pa.,	Uniontown	2 p.m., Sept. 18.	Constructing bridge	J. Gephart, Co. Engr.
Minn.,	Shakopee	11 a.m., Sept. 20.	Reinforced concrete bridge	A. J. Mayer, Co. Aud.
O.,	Hamilton	10 a.m., Sept. 25.	Concrete steel bridge	W. W. Crawford, Co. Clk.
Pa.,	Harrisburg	10 a.m., Sept. 25.	1,115 ft. vitrified block or bituminous concrete, Delaware Co.; 5,091 ft. plain concrete, Westmoreland Co	J. Denny O'Neil, State Highway Comr.
Minn.,	Winona	2 p.m., Sept. 26.	Concrete culvert material, 12 to 48 inch, reinforced concrete culvert, 10 ft. bridge extension, two reinforced concrete 30 ft. span bridges	State Hwy. Dept., St. Paul, Minn.
Ill.,	Herrin	Sept. 27.	Reinforced arch	W. O. Steinheimer, Engr., City Nat. Bank Bldg.

BIDS ASKED FOR

STATE	CITY	REC'D UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
Ill.,	Taylorville	Oct. 1.	Steel and reinforced concrete bridge construction	C. Pennington, Supt. of Hwys.
N. D.,	Jamestown	Oct. 2.	Constructing bridges	Co. Aud.

MISCELLANEOUS.

S. C.,	Foreston	Sept. 14.	Constructing 50 miles of canal, involving 173,000 cu. yds. excavation	Clarendon Co. Drainage Dist. No. 3, care of Maillard Lumber Co., Greeleyville.
N. J.,	Irvington ....4:30 p.m.,	Sept. 16.	Combination police patrol and ambulance wagon	Leonard Setaro, Dir. of Pub. Safety.
Fla.,	Bradentown	Sept. 16.	Constructing drainage system and laterals	W. M. Taylor, County Clerk
D. C.,	Washington	Sept. 16.	Constructng 6-in. fuel-oil supply line from Sewalls Point, Va., to naval operating base, Hampton Roads, Va. (Spec. No. 3311)	Bureau of Yards and Docks, Navy Dept.
Minn.,	Bemidji....8 p.m.,	Sept. 16.	Street sweeper and combination street sweeper and sprinkler	G. Stein, City Clk.
Tex.,	Galveston....11 a.m.,	Sept. 16.	Bulkhead and dredge	Bureau of Yards and Docks, Navy Dept., Washington, D. C.
N. Y.	Albany....noon,	Sept. 17.	Preparing existing bulkhead and constructing freight house and crane track in N. Y. City	W. W. Wotherspoon, Supt. of Public Works.
Tex.,	Galveston ....noon,	Sept. 18.	Jetty repairs	U. S. Engr. Office.
Mass.,	Nahant ....noon,	Sept. 30.	Constructing pile wharf	U. S. Engr. Office, Boston, Mass
D. C.,	Washington	Sept. 23.	Four 10-ton electric traveling cranes, overhead bridge type, each equipped with two 5-ton trolleys and installed on runways at Navy Yard, Norfolk, Va. (Spec. No. 3309)	Bureau of Yards and Docks, Navy Dept.
Tenn.,	Memphis ....11 a.m.,	Sept. 28.	Constructing about 123,000 cu. yds. of earthwork	Mississippi River Commission, Custom House.
Mass.,	Boston	Sept. 30.	Constructing pile wharf at Nahant, Mass.	U. S. Engr. Office
Tex.,	El Paso	Oct. 1.	Constructing canals on Rio Grande irrigation project, involving about 63,800 cu. yds. excavation, near Hatch, New Mexico	U. S. Reclamation Service, Washington, D. C.
Port Rico,	San Juan..10 a.m.,	Nov. 25.	Construction and installation of garbage and refuse incinerator plant	Bur. of Insular Affairs, War Dept., Washington, D. C.

ROADS AND STREETS

Birmingham, Ala.—The building of a 4-mile road from Lovick to Leads is contemplated by Jefferson Co. County Engineer S. R. Batson.

Harrisburg, Ark.—Comrs. Poinsett county receiving bids soon for building 16.7 mi. Black Oak Rd. and Lateral Nos. 1, 2, 3, 4 and 5, Rd. Impvt. Dist. No. 2, 22 ft. wide, involving 96,800 cu. yd. grading.

Sacramento, Cal.—Minor bids for work in Colusa, Placer and Merced Counties were found to be too high and were rejected. Advisory Board of State Highway Comn.

Davenport, Ia.—City contemplates asking for bids for a grading machine. It was learned that bids for grading work were lower by $4,000 than was estimated. It is said that with this amount a machine could be purchased and that the city could do the work.

Davenport, Ia.—As the result of a conference between Mayor C. M. Littleton and W. S. Shields, of the government housing board, it was decided that all paving leading to government tracts would be dropped this year with the exception of two streets. The two streets which the government insists on paving are South Ave. and Park lane. The rest of the program, numbering nearly a dozen streets, will be abandoned for the present. There will be no paving on streets leading to the McManus Ave. tract. These streets will be improved as much as possible, but will not be paved this year.

Indianola, Ill.—City soon lets contract for sidewalks. E. M. Wilson, City Clk.

Tipton, Ind.—Jackson St. sidewalk will be improved. City voted bonds amounting to $1,467.23.

Winnsboro, La.—See "Sewerage."

Aitkin, Minn.—Town soon lets contract for building 5.6 miles road. Jacob Wiebel, Clk.

Grand Marais, Minn.—The Cook county board of commissioners passed a resolution calling for the issuance of $100,000 refunding bonds to pay off outstanding road, bridge and revenue warrants. The bonds will pay 6 per cent. interest and bids will be opened by the county board Sept. 16.

Minneapolis, Minn.—A state highway 27 miles long will probably soon be built by Hennepin Co. (Minneapolis) & Dakota Co. (Hastings). It will extend from Cedar Ave. bridge south to Northfield.

St. Cloud, Minn.—For grading 17th Ave. N., from St. Germain St. to 1st St. N., city having plans prepared. R. E. Borrowman, city engr.

Wabasha, Minn.—Contract let in September for Federal Aid Project No. 21, State Roads Nos. 1 and 2, 13.96 miles: Excavation, 87,089 cu. yds.; guard rail, 3,120 lin. ft.; riprap, 42 cu. yds.; concrete end walls, 88 cu. yds.; culverts: 12-in., 60 lin. ft.; 15-in., 570 lin. ft.; 18-in., 397 lin. ft.; 24-in., 280 lin. ft.; 30-in., 92 lin. ft.; 36-in., 67 lin. ft.; 10 reinforced concrete culverts. Plans with State Highway Comn., Guardian Life Bldg., St. Paul.

Winona, Minn.—For Federal Aid Project No. 8, State Road No. 17, length 6.42 miles: Clearing and grubbing, 4.9 acres; earth excavation, 39,842 cu. yds.; solid rock excavation, 7,141 cu. yds.; culvert end walls, 180 cu. yds.; culverts: 12-in., 140 lin. ft.; 18-in., 622 lin. ft.; 24-in., 370 lin. ft.; 30-in., 65 lin. ft.; 36-in., 55 lin. ft; 48-in., 65 lin ft.; bridges: No. 2949, 10-ft. extension of cattlepass; No. 2865, 30-ft. span, reinforced concrete; No. 2866, 30-in. culvert, $34,019. Bids asked for work this month. Plans with State Highway Comn., Guardian Life Bldg., St. Paul.

St. Louis, Mo.—Board of public service received application to pave 10 ft. roadway and sidewalk with vitrified paving brick on the east side of Blair Ave. for a distance of 75 ft. between Mullanphy St. and Cass Ave.

Hamilton, Mont.—Plans to grade and gravel Main St., 7th St. to Adirondack

Morristown, N. J.—Bids will be received for paving Main road, Rockaway Boro., to be of brick or concrete. County Engineer W. Hopkins, Dover.

Ave.

Newark, N. J.—Passing of an ordinance is contemplated by this city for the purpose of the laying of a sidewalk on the east side of Sherman Ave., from Rudd court northerly to a point about 117 ft. north of lands now or formerly belonging to Erie Railroad Co., to the sidewalk already laid on the easterly side of Sherman Ave., and on the west side of said Sherman Ave. from Benson St. northerly to a point distant about 87 ft. north of property now or formerly belonging to Erie Railroad Co., to the sidewalk already laid on said westerly side of Sherman Ave. John A. Brown, borough clerk.

Ridgefield Park, N. J.—This city will soon make extensive street improvement. Bonds to the amount of $42,000 will be issued for that purpose.

Toms River, N. J.—Board freeholders Ocean county shortly receives bids building road from New Egypt to Allentown, Plumstead township. J. M. Abbott, county engr.

Columbus, O.—New bids will have to be called for by Board of Co. Comrs. of Franklin Co., for surfacing Caldwell road from National road east to Columbus-Newark road, in Truro Twp. No bids has been received so far.

Rocky River, O.—City will issue bonds, Sept. 17, for West Lake Road Imp., $11,000, 5½ per cent., 5½ years; North View Road, $10,000, 6 per cent., 5¼ years; Street Improvement, $63,000, 6 per cent., 5 years. David S. Jones, clerk of city council.

Portland, Ore.—City will improve Brazee St., E. 60th St., E. Everett St., E. 72d St., Tacoma Ave. Geo. R. Funk, auditor of City of Portland.

Portland, Ore.—The city is undertaking street improvement of west half of Minnesota Ave., to cost approximately $1,755. Geo. R. Funk, City Auditor.

Ebensburg, Pa.—A petition for an appropriation of $1,000 for grouting the brick paving between Lamb's bridge, near South Fork and Elton, was presented to the county commissioners by Commissioner E. W. Baumgardner, on behalf of the citizens of Adams township.

Wilkes-Barre, Pa.—Contracts for grading, paving and curbing South Hudson and South Columbia Aves., Miners Mills Boro., will be awarded by Lucerne Co. Concrete foundation, 1,250 lin. ft., brick or asphalt block, 27 ft. wide between curbs, $4.64 to $4.98 per sq. yd.

Austin, Tex.—State Highway Comn., at its July meeting, awarded aid for road construction totaling $764,007. Of this amount, $398,958 was State aid and $365,049 Federal.

Bristol, Va.—Bonds sold Sept. 23: State St., $30,000, 6 per cent., 10 years; Piedmont St., $20,000, 6 per cent., 10 yrs. Chapman Belew, city clerk.

Colfax, Wash.—Whitman county commissioners accepted bids of Ferris & Hardgrove, Spokane, for the placing of bonds for the Steptoe-St. John-Ewan road. Total amount to be issued is $242,000.

Lynchburg, Va.—For paving 1,000 sq. yd. Oakley Ave. with tar macadam city shortly lets contract. R. Jester, mayor.

What you can next Liberty Loan

Read this carefully—then ACT

THE three Liberty Loan issues already successfully floated have been put over by the win-the-war spirit of the American people.

In connection with the great work of awakening and quickening to action the spirit of war sacrifice which has been the greatest factor in the success of Liberty Loans it would be impossible to put too high a valuation on the splendid voluntary work of patriotic citizens and moulders of thought in all professions and occupations.

The very success of this volunteer leadership in creating enthusiasm has shown the desirability of organized methods for increasing its usefulness. And particularly to suggest to those leaders who feel that their circle of action is relatively small the enormous amount of good they can do as a whole **if each no matter how small or great (relatively) his sphere may be, will act with enthusiasm and system.** The great factory or store, society or club, church, or other organization with, say 5000 employees, members, or audience, does a great work in "selling" the Liberty Loan idea to such an aggregation. But that work is fully matched in aggregate importance by a hundred such institutions whose average pay-roll, membership, or audience, comprises only fifty persons each.

The nation has much other work to do. The Liberty Loan drives are necessarily carried through largely by volunteer work. In consequence they must be limited to specific brief periods for the actual subscription to the bonds.

THESE brief sharp campaigns have the advantage of building up white-hot waves of enthusiasm, but it is extremely difficult in such periods to secure close contact with all the wage-earning and money-making units of the public and especially to bring home personally to each individual the important serious personal relation which he or she should have to the war and to the successful financing of it.

To the accomplishment of that great end it is now proposed that you, as the leaders of thought and action in your community, see that chambers of commerce, business men's, church and labor organizations, civic societies

hold meetings shortly previous to the Fourth Loan campaign, not to take bond subscriptions but to arouse serious enthusiasm for the forthcoming Loan.

WHERE organizations are small, as for example small stores, similar organizations in the same or related lines of business can be invited to participate in one meeting. As for example, all of the grocers in a small city or all those in a given section in a large city, might get together in one meeting. But it would be a grocers' meeting. In such cases it would usually be wise to keep related trades together.

Whether the audience be great or small, every effort should be made to "stage the meetings effectively, to make them interesting and instructive and above all to give everyone an opportunity to speak, to discuss, to suggest, to enthuse their fellow employees.

"Win-the-War" Meetings need not be limited to any class. They can be equally effective if organized as "town meetings"—or by clubs, societies, churches, lodges or similar institutions. Leadership, organization, and a definite program will work wonders.

n do NOW to help the

It is not essential that such meetings be called Liberty Loan meetings—they would better be announced as "Win-the-War" meetings, and above all it should be made clear that no attempt will be made at these meetings to secure or accept subscriptions for Bonds or money for any purpose whatever—but in all the speaking and discussion attention should be largely devoted to the forthcoming Loan.

The Fourth Liberty Loan Campaign will begin on September 28th.

All of the preliminary meetings should be held not earlier than September 10th and not later than September 25th, unless there are special circumstances which would make an earlier or later meeting expedient.

THE LIBERTY LOAN BUREAU has prepared a booklet setting forth "Suggested Programs for Meetings to Prepare for the Fourth Liberty Loan."

They have asked us as publishers of a class paper to bring this suggestion for patriotic service to the attention of our readers and to urge its hearty adoption by all stores, factories, employers of labor in any capacity, societies, clubs or organizations of any kind who can arrange such meetings.

We have been furnished with copies of the booklet giving "Programs for 'Win-the-War' Meetings"—and will send a copy promptly to anyone signing the coupon below and mailing it to us. The signing of the coupon is your pledge to arrange such a meeting of some group or groups of citizens which you can bring together previous to the Fourth Liberty Loan Campaign and your pledge when received will be turned over to the Liberty Loan Bureau and officially acknowledged.

Such meetings organized in the "Win-the-War" spirit will not only help tremendously to insure 100 per cent subscriptions to the Fourth Liberty Loan among your people—they will do more than almost any other one thing could to develop among all ranks of the public the stern spirit of sacrifice and the necessity for loyal, constant, steady service of each and every one in the great national work of victory for the cause of Liberty and Democracy.

They will serve to educate and make clear to all the vitally important way in which work and sacrifice here in our midst help and sustains the work of our fighting men "over there."

This is an opportunity for every citizen to do a great and helpful work for the Fourth Liberty Loan and one which will help win the war.

There is plenty of time for efficient action. There is no time to lose in preparing for that action.

THE MUNICIPAL JOURNAL.

Sign the Coupon
Mail it to

Municipal Journal
243 W. 39th St., N. Y. City

Get the Book
Hold Your Meeting
and
make it a
"hummer"

This space contributed to the winning of the war by MUNICIPAL JOURNAL

I pledge myself to organize and hold a "Win-the-War" meeting previous to the opening of the Fourth Liberty Loan Campaign in order to help float the Loan.

Send me †..... copy of Liberty Loan Committee Booklet giving suggestions for Programs for such meetings.

Signature .....

Position or Title.....

***Firm** .....

Street No. .....

City .....

State .....

Date.....

*If a Society, Club or similar organization give name here.
†If more than one copy is desired state number.

Ferndale, Wash.—E. Field, town clerk, reports the council has passed an ordinance providing for the issuance of bonds in the sum of $9,349.29 for the payment of the cost of grading, paving and sewers in 3d, Railroad, Washington Sts., et al.

Roanoke, W. Va.—The city council decided on the reconstruction of Park St. to Loudoun Ave., and of 13th St., from Wasena Ter. to Virginia bridge. Virginia Ave. is to be paved from McClanahan Pl. to 7th St; first macadamized and then finished with Bermudez asphalt binder. The city engineering department states that contractors are not bidding for work very readily now, owing to the scarcity of labor and the extreme uncertainty of the building materials market. A force has been organized to maintain the streets as well as is possible under wartime conditions, and what work is done on the streets of Roanoke will be thorough and serve as a foundation for more extensive work later. Considerable sewer reconstruction is going forward now in different parts of the city.

Seattle, Wash.—Ordinance passed providing for laying off and establishing of Northlake Pl. from Northlake Ave. to N. 34th St.

Green Bay, Wis.—$270,000 worth of bonds were voted by board of supervisors of Brown county. Purpose of same highway building, mainly in town of Lawrence, on Green-Bay-Appleton road.

Manitowoc, Wis.—$25,000 worth of bonds will be sold by council for docks if government approves.

Sheridan, Wyo.—Plans are being made for laying pavements in District No. 8. O. F. Svanberg, Clk.

Lulu Island, B. C.—Construction of a roadway costing $14,000 considered by Richmond municipality. A. E. Foreman, Victoria, Engr.

Vancouver, B. C.—For Dept. of Railways and Canals, Ottawa, work will commence in near future on building 70 miles of roadway. Secy., J. W. Pugsley, Ottawa.

Vancouver, B. C.—City Council considers paving streets, about $950,000. E. L. Fellowes, Engr.

Vancouver, B. C.—Dept. of Pub. Works, Victoria, plans, at a cost of $10,000, to construct pavements.

BIDS RECEIVED AND CONTRACTS AWARDED.

(*Indicates Contracts Awarded.)

Manhattan Beach, Cal.—Low bids were received by city for paving 13½ blocks Ocean Ave., involving 66,464 ft. 5-in. concrete base and 3,400 lin. ft. curb.

Sacramento, Cal.—*Connors-Greene Co., Castella, was awarded contract by State Highway Comn., for grading 1.5 mile between Dunsmuir and southern boundary, Siskiyou Co., 24 ft. wide, involving 12,000 cu. yds. grading, 200 lin. ft. 12-in., 56 lin. ft. 18-in. and 250 lin. ft. 24-in. corrugated metal pipe, and 160 cu. yds. class "A" concrete. About $19,417.

Sacramento, Cal.—*A. Rolandi, of San Francisco, for grading new Federal Post Road between Redding and Tower House, $185,864, by Advisory Board of State Highway Comn.

Sacramento, Cal.—*Connors-Green Co., of Castella, will build link in highway between Dunsmuir and Southern County boundary, for $19,417; *H. C. Finn, for section of road between Ignacio and Black Point, for $11,000. Advisory Board of State Highway Comn.

Sacramento, Cal.—*H. C. Flinn, First Natl. Bank bldg., San Francisco, has contract from state highway commission for grading 2.75 mi. between Ignacio and Black Point, Marin county, 24 ft. wide, involving 10,000 cu. yd. grading; about $11,000.

Salinas, Cal.—*F. C. McIntire, of Stockton, for construction of San Ardo-San Lucas section of Coast Highway in Monterey County; $117,268. Advisory Board of State Highway Comn.

Davenport, Ia.—*Several out of town firms were among the bidders on grading jobs on which bids were opened by the board of public works. With one exception, the jobs went to the Littig Construction Co., of Davenport. Thomas Carey & Son, Clinton, were lucky bidders on Grant St., from Harrison to Scott Sts. The other streets on the program, which were awarded to the Littig Co., were: Arlington Ave., South Ave. to 33d St.; Grand Ave., South Ave. to 33d St.; 33d St., Brady to Arlington; Farnam St., South to 33d; 31st, Farnam to Arlington; Park lane, Harrison St. to 150 ft. west of Western Ave.; Garfield St., Harrison St. to Gaines; Telegraph road, Indian road to city limits; Telegraph road, Bowditch St. to Indian road.

Cedar Rapids, Ia.—*J. B. Ford & Son, 221 First Ave. W., for sidewalks, approximately 6,000 lin. ft; $6,975. L. J. Storey, Clk.; Engr., T. F. McCauley.

Knoxville, Ia.—*F. Shugart & Barnes contracted to grade for Marion Co. the following: Knoxville-Red Rock, Knoxville-Tracy, Knoxville-Columbia and Knoxville-Pleasantville roads, involving 18 miles finished grade.

Sioux City, Ia.—*Jensen & Krage, for sidewalks in Hedges, Morningside, Henrietta Pl., Peters Pl., North Sioux City, Riverview, Clark's, Cole's Additions, Higman Addition, Lowell, Orchard and Hill Additions, by Council.

Chicago, Ill.—*J. A. Ross & Co., 4561 Armitage Ave., (a) $2,794; (c) $9,218; (d) $2,512; (f) $3,316; (g) $2,998; (h) $3,425; (i) $2,650. *Central Paving Co., 179 West Washington St., (b) $721. *J. Dillon & Co., 179 West Washington St., (e) $4,-187. For paving alleys and streets as follows: (a) Addison, Cornelia, Wilton and Sheffield Aves., 530 cu. yd. grading, 1,050 sq. yd. concrete paving; (b) Goethe, Division, Clark and La Salle Sts., 109 cu. yd. grading, 230 sq. yd. concrete paving; (c) Glenlake, Norwood and Glenwood Aves. and Broadway, 668 cu. yd. grading, 2,360 sq. yd. concrete paving, 920 ft. 10-in. tile pipe sewer, catch basins, etc.; (d) Schubert and Whipple Sts., Logan Blk., Albany Ave., 163 cu. yd. grading, 1,050 sq. yd. 7-in. concrete paving; (e) Schubert, Rockwell and Talman Sts., Logan Blk., 1,180 ft. concrete curb, 235 cu. yd. filling, 790 sq. yd. vitr. brick paving on 6 in. concrete base; (f) Van Buren, Congress, Kedzie and Spaulding Sts., 328 cu. yd. grading, 1,320 sq. yd. 7-in. concrete pavement; (g) Eastwood, Wilson, Albany and Kedzie Aves., 234 cu. yd. grading and 1,220 sq. yd. 7-in. concrete paving; (h) Wilcox and Adams Sts., California and Francisco Aves., 310 cu. yd. grading, 1,380 sq. yd. 7-in. concrete paving; (i) Flournoy and Lexington Sts., Francisco and California Aves., 274 cu. yd. grading, 1,040 sq. yd. 7-in. concrete paving. Board of local improvements.

Chicago, Ill.—*R. F. Conway Co., 133 West Washington St., (a) $11,935; (d) $8,912; (f) $13,256; (j) $12,122; (m) $3,-293. *Amer. Asphalt Paving Co., 133 West Washington St., (b) $7,981; (e) $8,637; (n) $23,378. *F. P. McCormick, 82 West Washington St., (l) $57,485. *J. A. McGarry, 189 West Madison St., (c) $65,-566. *Smith & Brown, 128 North La Salle St., (h) $42,065. *J. A. Sackley Co., 179 West Washington St., (g) $84,059. *Standard Paving Co., 29 South La Salle St., (i) $14,802. *Reidy & Callahan, Chicago, (k) $98,197. For paving the following streets: (a) Ainslie St. from Whipple St. to Kedzie Ave., 2,450 ft. concrete curb and gutter, 1,000 cu. yd. grading, 3,350 sq. yd. asphalt paving on 6-in. concrete base, catch basins, etc.; (b) Constance St. from E. 72d to E. 73d Sts., 1,280 ft. concrete curb and gutter, 1,300 cu. yd. grading, 1,860 sq. yd. asphalt paving on 6-in. concrete base; (c) Devon Ave. from Ridge Rd. to Western Ave., 7,000 ft. concrete curb and gutter, 8,800 cu. yd. grading, 10,300 sq. yd. brick paving on 6-in. concrete base, catch basins, etc.; (d) Edgecombe Pl. from Broadway to Sheridan Rd., 360 ft. concrete curb and gutter, 1,000 cu. yd. grading, 2,600 sq. yd. asphalt paving on 6-in. concrete base, catch basins, etc.; (e) E. 45th St. from Vincennes Ave. to Grand Blvd., 1,350 ft. concrete curb and gutter, 1,000 cu. yd. grading, 2,250 sq. yd. asphalt paving on 6-in. concrete base; (f) Glenwood Ave. from Argyle St. to Foster Ave., 1,600 cu. yd. grading, 4,100 sq. yd. asphalt paving on 6-in. concrete base; (g) Jeffrey Ave. from E. 83d to E. 93d Sts., 12,610 ft. sandstone curb, 16,000 cu. yd. filling, 27,-420 sq. yd. paving with 8-in. blast furnace slag or limestone and 2¼-in. limestone bonded with asphalt cement; (h) Kedzie Ave. from Lawrence to Foster Aves, 3,830 ft. concrete curb, 3,500 cu. yd. grading, 6,880 sq. yd. vitr. brick paving, 750 sq. yd. granite block paving on 6-in. concrete base; (i) Karlov Ave. from W. 31st to W. 33d St., 2,600 ft. concrete curb and gutter, 900 cu. yd. grading, 4,160 sq. yd. asphalt paving on 6-in. concrete base; (j) Lowell St. from Sunnyside Ave. to Elston Ave., 2,200 ft. concrete curb and gutter, 1,750 cu. yd. grading, 2,960 sq. yd. asphalt paving on 6-in. concrete base; (k) E. 106th Et. from Torrance Ave. to 3,550 ft. east, 6,840 ft. concrete curb, 25,000 cu. yd. filling, 10,400 sq. yd. brick paving on 6-in. concrete base; (l) Stony Island Rd. from E. 79th to E. 83d St., 4,780 ft. concrete curb, 4,760 ft. gutter, 9,000 cu. yd. grading, 14,900 sq. yd. asphalt paving on 6-in. concrete base; (m) Waveland Ave. from Francisco Ave. to Richmond St., 670 ft. concrete curb and gutter, 200 cu. yd. grading, 920 sq. yd. asphalt paving on 6-in. concrete base; (n) Homer Ave. from Lamon to La Crosse Ave., Cortland St. from Grand to Cicero Ave., La Crosse Ave. from Cortland St. to Armitage Ave., 3,720 ft. concrete curb and gutter, 2,800 cu. yd. grading, 200 cu. yd filling, 5,860 sq. yd. asphalt paving on 6-in. concrete base. Board of local improvements.

East Chicago, Ind.—*Shea & Co., Hammond, were awarded contract for paving 139th St., concrete, $16,500.

Indianapolis, Ind.—Adam Swank, Nashville, Ind., was awarded by the commissioners of Brown county the contract for the Wilson road in Jackson township; $12,000.

St. Boniface, Man.—*Cusson Lumber Co., Ltd., was given contract by department of public works for paving Marion St., from Des Meurons St. to Dawson road, 24 ft. wide, bitulithic, about $103,-790.

Muskegon, Mich.—*J. R. Edelman, Muskegon, was successful bidder for contract to pave Water St., monolithic brick, on 4-in. reinforced concrete base.

Chaska, Minn.—*Hawkinson & Hohle, 3304 Longfellow Ave., Minneapolis, for surfacing Jobs 1, 2, 3, 4 and 5, Federal Aid Project No. 12, State Road Land 3, 26 miles. Loading, hauling and placing 27,785 cu. yds. gravel surfacing material. $30,261. J. B. Connolly, County Aud.

Chaska, Minn.—*Hawkinson & Hohle, 3304 Longfellow Ave., Minneapolis, received contract from Carver Co. for surfacing 26 miles Jobs Nos. 1, 2, 3, 4 and 5 Federal Aid Project No. 12. About $30,-261. Work involves 27,875 cu. yds. gravel surfacing.

Robbinsdale, Minn.—*Plymouth Paving Co., 720 Plymouth Ave., Minneapolis, for sidewalks.

Slayton, Minn.—Contract was let to *R. G. Wright, Minneapolis, by Murray Co. for building 29.1 miles State Road No. 5, Federal Aid Project No. 33, involving 46,-556 cu. yds. gravel surfacing. About $62,000.

Kansas City, Mo.—Low bids were received by the board public works for paving the following: (a) 5,535 sq. yds. Mulberry St., from 9th to 13th St., granite block; (b) 4,790 sq. yds. 8th St., from point 279 ft. east of Santa Fe to Madison Ave., granite block; (c) 8,822 sq. yds. Hickory St., from St. Louis Ave. to West Kansas Addition No. 2, granite block; (d) 2,948 sq. yd. 13th St., from Liberty to Mulberry Sts., granite block.

Hoboken, N. J.—O'Reilly Contg. Co., 90 Neptune Ave., Jersey City, $44,425; W. T. S. Crichfield, 54 5th St., Hoboken, $50,-200; R. Waddington Co., 617 Adam St., Hoboken, $55,000, low bidders for repairing 4th, 7th and 14th Sts. and Willow Ave.

Jersey City, N. J.—*A. Lettieri & Sons Co., 261½ Wayne St., for about $24,000, for repairing 9th St. from point east of Erie to Grove St., wood block pavement. City commissioners.

Trenton, N. J.—The state highway commission received bids for work on sections of the new state highway system. For Route 13, Section 2, from Kingston to New Brunswick, a little more than 4½ miles, the low bidder was the Utilities Construction Co. of New Brunswick. Its bid was $335,199.30. The next low bidder was the C. H. Winans Co., of Elizabeth, whose bid was $377,133.81.

Trenton, N. J.—Bids were received by the state highway commission for Route 6, the Mantua-Woodbury section, a little more than 2 miles. William P. McDonald Construction Co., Mt. Vernon, N. Y., bid $104,041.20. The Union Paving Co., Philadelphia, bid $108,757.37.

Utica, N. Y.—H. W. Roberts & Co., 60 Lansing St., for paving State St., about $16,982, by city.

Columbus, O.—State Highway Department: Low bidders, Aug. 30; estimated cost, $823,448.31; covering 37.166 miles of new State Aid work: Brown County, Section N, Cincinnati-West Union Road—no bids;; Clermont County, Section K-1, Cincinnati-Chillicothe Road—no bids; Clermont County, Section F-1, Cincinnati-West Union Road—no bids; Clermont County, Section J, Bethel-Chilo Road—no bids; Coshocton County, Section A, Cambridge-Coshocton Road—no bids; Coshocton County, Section C-1, Newark-Coshocton Road—no bids; Hamilton County,

Section B, Harrison Road—Gradison Const. Co., 216 E. Front St., Cincinnati, O., $39,887.80; Hardin County, Section A-1, Bellefontaine-Kenton Road—Gray Bros., Bowling Green, O., $33,136.99; Highland County, Section A, Hillsboro-Chillicothe Road—no bids; Highland County, Section B, Hillsboro-Chillicothe Road—no bids; Highland County, Section C, Hillsboro-Chillicothe Road—no bids; Licking County, Section E-1, Newark-Mt. Vernon Road—Gray Bros., Bowling Green, O., $33,241.36; Mahoning County, Section D, Youngstown-Lisbon Road—E. J. Kane, Youngstown, O., $71,091.30; Morgan County, Section H, McConnellsville-Athens Road—H. D. Curtis, Greenville, O., $42,203.12; Muskingum County, Section L-2, Zanesville-Cincinnati Road—cancelled; Muskingum County, Section M-2, Zanesville-Dresden Road — cancelled; Paulding County, Section D, Van Wert-Fort Wayne Road—Putnam & Shingle-County, Section J-2, McArthur-Chillidecker, Van Wert, O., $27,289.80; Vinton Road—no bid; Williams County, Section L, Bryan-Pioneer Road—C. W. Fuelling, Pioneer, O., $72,883.43; Medina County, Section A, Cleveland-Wooster Road—no bid; Mahoning County, Section R-2, Akron-Youngstown Road — cancelled. Clinton Cowen, State Highway Comr.

Portland, Ore.—*Miller & Bauer, contractors, completed contract for improvement of E. 14th St. *S. Simonson completed contract of improving E. 16th St. and Tenim Ave. O. Laurgaard, city engineer.

Portland, Ore.—Low bids were received by Public Roads Comn., at Portland, for grading 10.1 miles Canyonville-Galesville road, Umpqua National Forest, 16 ft. wide, involving 293 cu. yds. class "A" concrete, 80,000 cu. yds. grading, 42,000 cu. yds. rock, 77,000 cu. yds. overhaul, 24,500 lbs. reinforced concrete and 3 span truss bridges.

Santa Ana, Cal.—Contract for grading about 1.86 mile of Santa Ana Canyon road was given to *Sharp & Fellows Contr. Co., Los Angeles, $39,001.

Portland, Ore.—The office of the Public Roads & Rural Engineers, room 202 Broadway-Yamhill Bldg., received bids for improving the Three Rivers road project in Siuslaw-National Forest in Tillamook county. The bids were forwarded to Washington for award with the recommendation that the grading and surfacing be awarded to Tillamook county and that the bridges be awarded to Curtis Gardner of Portland.

Del Rio, Tex.—*To Uvalde Rock Asphalt Co., Swearingen bldg., San Antonio, was awarded contract by Valvera county for improving 4.9 mi. state highway No. 4; about $40,000.

Spokane, Wash.—*Mitchell Bros., Paulsen Bldg., Spokane, received contract for grading and paving 950 lin. ft. Trent Ave. from West Trent bridge to Grant St., 75 ft. wide, involving 626 cu. yds. 5-in. concrete, 3,789 sq. yds. bituminous, 248 lin. ft. granite block, 1,445 cu. yds. grading, 1,804 lin. ft. concrete curb, 681 sq. yds. brick gutter and 674 sq. yds. 4¼-in. concrete sidewalks. About $15,578.

Kenosha, Wis.—*D. Jordenson, Kenosha, for paving and water service, Pomeroy St. from Sheridan Rd. to Charles St.

Madison, Wis.—*J. R. McDonald, Black River Falls, was awarded contract by State Highway Com. to build 13,300 ft. Black River Falls-Melrose road, Federal Aid Project No. 24, 16 ft. wide, involving 12,305 cu. yds. grading, 20,350 sq. yds. 7¼-in. concrete, 42 cu. yds. borrow, 267 cu. yds. class "A" concrete and 1,905 lin. ft. guard rail.

Superior, Wis.—Magnus Peterson low bidder for forfeited contract for Russel Const. Co. for concrete paving of Cadotte Ave.; $10,294.32. Other bidders: Sid Riches & Son, $10,559.15; Peter Bergman, $10,814.77.

Morgantown, W. Va.—*C. W. McCormick, Morgantown, W. Va., for repaving Kingwood and Bridge Sts., old brick blocks on cinder base; 30,000 new brick blocks ordered, 10 per cent. basis for supervising work. City.

SEWERAGE AND SANITATION

Morrilton, Ark.—A sewer system will be installed. It will cost about $20,000. Engineers: Howard & Ash, Crear-Leslie bldg., Kansas City.

Huntsville, Ala.—$7,500 was voted to construct a sanitation system in county.

Talladega, Ala.—$5,000 will be spent for a sanitation system in county.

Sanger, Cal.—City sold Aug. 1 to McDonnall & Co., of San Francisco, sewer bonds; $15,000. Annie M. Burns, City Clk.

Tampa, Fla.—City will expend $15,000 constructing storm sewers. D. B. McKay, Mayor and Chmn. Comrs. of Pub. Works.

Pensacola, Fla.—United States Housing Corp., 613 G St., N. W., Washington, will construct sewers in connection with town site development near Navy Yard. Arthur Pew, Forsyth Bldg., Atlanta, Ga., is project engineer and has just made survey of site.

Tampa, Fla.—Storm sewers may be constructed by city to cost about $15,000. D. B. McKay, chairman, commissioner of public works.

Macon, Ga.—See "Miscellaneous."

Macon, Ga.—Bids will be received until Sept. 17 by David S. Jones, City Clk., for $55,000 sewer bonds, $55,000 auditorium bonds, $75,000 hospital bonds and $15,000 park buildings bonds.

Thomson, Ga.—Will soon invest money in a sewer system. Bonds have been voted for that purpose; $21,000. 5 per cent., 30 years.

Creston, Ia.—Sewer improvements may be installed. They will consist of 500 lin. ft. of 10-in. and 4,230 lin. ft. of 8-in. sewer pipe, 75 ft. of manholes and four flush holes. Howard C. Miller, city clerk.

St. Louis, Mo.—Board of public service is going to install the plumbing and drainage in a receiving cottage at Bellefontaine Farms.

Dubuque, Ia.—City council plans to construct an 8-in. tile pipe sanitary sewer in Queen St. from Edward St. to Pfotzer St. John Stuber, city recorder.

Wapello, Ia.—$45,000 worth of drainage bonds in Louisa county were awarded to Bankers Mortgage Co.

Chicago, Ill.—Contract shortly let for constructing sewers in the following streets: South Talman Ave. from 109th to 110th St., involving 670 ft. 12-in. tile sewer pipe, about $1,400; W. 124th St. from Wentworth Ave. to Lafayette St., Lafayette St. and Perry Ave. from 124th St. to alley south of 123d St., South La Salle St. from point 190 ft. north of W. 125th St. to alley south of W. 123d St., 330 ft. 25-in., 330 ft. 22-in., 330 ft. 15-in. and 1,030 ft. 12-in. tile pipe sewer, about $7,500; South Spaulding St. from W. 37th to W. 38th Sts., 240 ft. 12-in. tile pipe sewer, about $527; South St. Louis Ave. from W. 37th to W. 38th Sts., 560 ft. 12-in. tile pipe sewer, about $1,222; South State St. from E. 121st to E. 125th Sts., 930 ft. 20-in., 670 ft. 18-in., 670 ft. 15-in. and 620 ft. 12-in. tile pipe sewer, about $9,000; North Long Ave. from North Ave. to Cincinnati, Milwaukee & So. Paul R. R. tracks, 620 ft. 18-in., 670 ft. 15-in. and 400 ft. 12-in. tile pipe sewer, about $4,500; South Spaulding St. from W. 38th to W. 39th Sts., 265 ft. 12-in. tile sewer pipe, about $561; also laying water pipe in South Ada St. from W. 83d to W. 85th Sts., 1,400 ft. 8-in. c.-i. water pipe, about $2,285. Board local improvements.

Winnsboro, La.—City plans to spend about $80,000 on building sewers, water works and sidewalks. X. A. Kramer, Magnolia, Miss., engr.

Fairmont, Minn.—City soon lets contract for 68,000 ft. 18-in. sewer mains, Imhoff tank, and sludge drying beds. E. L. Lewis, City Clk.

Fairmont, Minn.—Bonds for $31,000 will be issued for ditch building in Martin county. County commissioners.

Newark, N. J.—J. S. Rippel, of this city, bought the 5 per cent. bonds sold by Newark to pay $1,725,000 as part of its share of the cost of the Passaic Valley sewer. Because of the premium offered they netted an interest rate of 4.70 per cent. Mr. Rippel will receive $1,663,000 in bonds.

Binghamton, N. Y.—The board of contract and supply is open for bids for the construction of six sewers in different parts of city, to-wit: Downs Ave., Columbus Ave., Baxter St., Jeannette Ave., Walnut St. and Beman St.

Du Bois., Pa.—Ordinance passed by city to install sewer on Tuller St. J. C. Weaver, city clerk.

Astoria, Ore.—The common council of the city has declared its intention to construct a sewer on Olney Ave. from the manhole in Seventh to the manhole to be constructed in the sewerage and drainage district, known as sewerage and drainage district No. 5, at Fifth St. It will consist of a 16-in. salt-glazed vitrified sewer pipe, and from the said manhole on Sixth St., westerly to the manhole on Fifth St., the said sewer shall be an 18-in. salt glazed vitrified sewer, together with all necessary way branches; also will construct a sewer on 48th St. from the north line of Cedar St. with 14-in. glazed vitrified sewer pipe.

Cuyahoga Falls, O.—Bonds will be issued Sept. 16 for Sacket St. sewer, $13,500, 6 per cent., 8½ years.

Portland, O.—City decided to build a sewer in Williamette Blvd. Probable cost, $1,480.04. Geo. R. Funk, auditor.

Portland, O.—A sewer will be constructed by this city in Ellis Ave. Probable cost $590.90. Geo. R. Funk, auditor.

Portland, Ore.—Notice is given of the assessment for the construction and repair of the Tanner Creek sewer from a point on 17th St., 485 feet south of Taylor St. and running in a northeasterly direction to the Willamette River at a point near the intersection of Pettygrove St. and Front St. Geo. F. Funk, auditor of City of Portland.

Wallowa, Ore.—At a regular meeting of the city council, *J. H. Childs, of La Grande, was awarded the contract for constructing a sewer system for the city of Wallowa. The specifications call for building a sewer and installing a septic tank, and for this work Mr. Childs bid $15,125.34. His nearest competitor was $15,911.79. The work will start in a short time, according to Mr. Childs.

Mobridge, S. D.—Question of issuing $50,000 sewer system bonds was carried at election on Aug. 6. J. E. Robinson, City Aud.

Mobridge, S. D.—This town will extend its sewer. It voted $50,000 bonds for that purpose.

Portsmouth, Va.—This city intends to put in a sewer system. J. Weaver, city engineer.

Ferndale, Wash.—See "Streets and Roads."

Ferndale, Wash.—See "Streets and Roads."

Manitowac, Wis.—Pitz & Pentzien are receiving bids for sewers and water pipe. Part of work is trenching for sewer and water pipe, laying pipe and back filling.

BIDS RECEIVED AND CONTRACTS AWARDED.

(*Indicates Contracts Awarded.)

Sacramento, Cal.—*Clark & Henery Construction Co., to construct the sewer in the Curtis Oaks and Highland Park districts, about $23,060. City commission.

Camp Gordon, Ga.—*Southern Ferro-Concrete Co., Atlanta, to construct additions to sewerage system at camp; cost, about $75,000.

Omaha, Neb.—*A. F. Hansen, 2907 Douglas St., $6,371; *J. J. Hanighan, 617

MUNICIPAL AND CORPORATION BONDS PURCHASED

Correspondence invited from officers of Municipalities and from well-established industrial corporations contemplating new financing.

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Bids received until October 2, 1918.

Highway Improvements

STATE OF NEW JERSEY
STATE HIGHWAY COMMISSION
TRENTON

Notice is hereby given that sealed bids will be received by the State Highway Commission of New Jersey for the improvement of the following:

STATE HIGHWAY ROUTE NO. 5, SECTION 1A—Bituminous Concrete Surface (Warrenite); estimated, 48,880 square yards. Morris County.

STATE HIGHWAY ROUTE NO. 14, CAPE MAY-RIO GRANDE SECTION—Concrete Surface; estimated, 48,580 square yards. Cape May County.

Bids will be opened and read in public at the office of the State Highway Commission, Broad Street Bank Building, Trenton, N. J., on Wednesday, October 2, 1918, at 10:30 A. M.

Drawings, specifications and forms of bid, contract and bond for the proposed work are on file in the office of the said Department, at Trenton, N. J., and in the offices of Roy Mullins, Division Engineer, 503 Market Street, Camden, N. J., and E. M. Vail, Division Engineer, 790 Broad Street, Newark, N. J., and may be inspected by, or furnished on, deposit of ten dollars ($10) to prospective bidders. Bids must be made on the standard proposal forms in the manner designated therein and as required by the specifications, same to be enclosed in sealed envelopes bearing the name and address of bidder and name of the road on the outside, addressed to State Highway Commission, Broad Street Bank Building, Trenton, N. J., and must be accompanied by a certified check for not less than ten per cent. (10%) of the amount of the bid, and be delivered at the above place on or before the hour named. Copies of standard proposal form will be furnished on application.

Each bidder must accompany his bid with a certificate from a surety company, duly authorized to do business in this State, stating that such surety company will provide said bidder with a bond in such sum as is required in, and in accordance with, the provisions of said specifications, conditioned for the faithful performance of the provisions of the contract and specifications.

By order of the State Highway Commission.

A. LEE GROVER, Chief Clerk.

Bids received until September 25, 1918.

Pavement Reconstruction

Pennsylvania State Highway Department, Harrisburg, Pa.—Sealed proposals will be received at said office until 10:00 A. M., September 25, 1918, when bids will be publicly opened and scheduled, and contracts awarded as soon thereafter as possible, for the reconstruction of 1,115 lineal feet of either Vitrified Block Pavement or Bituminous Concrete on a Concrete Foundation, from 20 to 34 feet in width, situated in Yeadon Borough, Delaware County, on Route No. 130; also 5,091 lineal feet of One Course Plain Cement Concrete Pavement, eighteen (18) feet wide, situated in Ligonier Borough, Westmoreland County, on Route No. 119. Bidding blanks and specifications may be obtained free, and plans upon payment of $2.50 per set, upon application to State Highway Department, Harrisburg. No refund for plans returned. They can also be seen at office of State Highway Department, Harrisburg; 1001 Chestnut Street, Philadelphia, and 904 Hartje Building, Pittsburgh, Pa. J. D. O'NEIL, State Highway Commissioner.

Bids received until November 25, 1918.

Garbage and Refuse Incinerator

OFFICE OF THE MAYOR OF SAN JUAN, PORTO RICO.

San Juan, P. R., August 20, 1918.

Sealed proposals will be received by the Commission of Awards at the office of the Mayor, Ayuntamiento Building, City of San Juan, P. R., until 10:00 o'clock A. M., on November 25, 1918, for the construction and installation of a Garbage and Refuse Incinerator Plant at Miramar, San Juan, P. R.

At the above place and time the bids will be publicly opened and read. Instructions to bidders, topographical plan of site of work, and general specifications can be obtained either from the City Engineer, San Juan, P. R., or from the Bureau of Insular Affairs, War Department, Washington, D. C.

The right is reserved to reject any and all bids.

R. H. TODD,
Mayor of San Juan, P. R.

S. 14th St., $109,306; *E. P. Donahue, 306 Lincoln Bldg., $34,603; *H. J. Petersen, 3701 S. 17th St., $1,675; *Katz Const. Co., 430 Bee Bldg., $21,617; *J. J. Hanighan, 617 S. 14th St., $41,208, for installing Storm Sewer No. 421, Storm Sewer No. 426, Storm Sewer No. 427, Storm Sewer No. 358, Storm Sewer No. 423, Storm Sewer No. 425. Herman Beal, City Engr.

Anamoose, N. D.—*Aiken Const. Co., Fargo, for sewer extension on McHenry St. from Peterson Ave. to Cottage Grove Ave., and on Atkinson Ave. from McHenry St. to Main St., in Sewer Improvement District No. 1. F. J. Junke, Village Clk.

Wallowa, Ore.—*J. H. Childs, of La Grande, Ore., for sewer system, at $15,124.34.

Antigo, Wis.—*Aug. Gamon, Antigo, for storm sewer; $50,000.

WATER SUPPLY

Coalinga, Cal.—For furnishing engine, pump and motor for auxiliary pumping plant for water system, bids are being received. C. T. Walker, clerk; F. G. Dessery, Central Bldg., **Los Angeles, engr.**

Santa Monica, Cal.—City will install during 1918 1,000 ft. 4-in. cast-iron pipe, 100 service connections, 250 new service meters, and will purchase one or two small motor trucks. Wm. H. Carter, 2668 Highland Ave., Comr. of Pub. Works.

Washington, D. C.—Upon the plea of Senator McNary the capitalization commission reversed the decision of the local board at San Francisco disapproving the $100,000 bond issue of the Talent Irrigation Co. This will permit the immediate raising of funds with which to construct a dam to provide water for 18,500 acres of land. The total issue of bonds will be $600,000, but only $100,000 is asked for this year.

Ellenton, Fla.—Bids are wanted by Atlantic Refining Co., J. R. Etter, Supt., this city, for sinking 6-in. artesian well; work to be begun immediately.

Decatur, Ill.—The $25,000 bond issue voted by the city for the carrying out of the projected water impounding system is the greatest effort ever attempted by the city and will involve a total expenditure of $325,000, $100,000 of which will be paid by the sanitary district trustees. Actual construction on the concrete dam which is to hold billions of gallons of water and form an attractive lake, probably will not begin before early next spring. In the meantime, however, the officials will buy the land adjacent to the Sangamon River which will be flooded when the new dam is complete. This land must be cleared of all trees and brush, and as the fall and winter is the ideal time for clearing land, the time between now and spring will be devoted to that purpose. It is likely that the wings of the dam, which will be principally earthwork, might be built this fall.

Winnsboro, La.—See "Sewerage."

Minneapolis, Minn.—This city expects to lay 12 miles 6 and 12-in. c.-i. pipe. W. D. Young, registrar.

Virginia, Minn.—New bids for 4,000 ft. of water mains to be laid in Virginia and Rainey Lake yards will probably have to be called as all those received were rejected.

Ecorse, Mich.—The water supply system planned by this town is needed to provide the newly-settled district which sprang up lately due to war activities.

Inverness, Miss.—Bids for building water works system rejected by city. X. A. Kramer, Magnolia, Miss., engr.

Palmer, Neb.—Bonds for $40,000 were voted by citizens for reconstructing water works system and electric light plant.

Livingston, Mont.—Minnesota Loan & Trust Co. purchased $35,000 6% bonds, paying premium of $2,160. Bonds issued for construction of reservoir by city.

Trenton, N. J.—A new 1-story brick and concrete pumping plant will be installed by the American Steel & Wire Co. Building permit has been granted.

Manchester, N. Y.—Issue of water and sewer bonds, $31,000, has been purchased by Isaac W. Sherrill Co., of Poughkeepsie.

Lima, O.—City sold issue water bonds, $150,000, to Harris, Forbes & Co., of New York. David L. Rupert, City Aud.

Depew, Okla.—Intends to build water works. Bonds to be issued for that purpose will amount to $20,000.

Garber, Okla.—City at election here voted waterworks bonds; $25,000.

Guthrie, Okla.—Proposition to issue water bonds, $165,000, may be submitted to voters.

Homing, Okla.—Issue of $50,000 waterworks bonds has been voted

Madill, Okla.—For about $60,000 city shortly let contract for 1½ mi. 8-in. c.-i. pipe. Benham Engrg. Co., Colcord Bldg., Oklahoma.

Hamilton, Ont.—From intersection of Main and King Sts., in West End, to Macklern Survey, Works Dept. will soon commence laying 20-in. water main. Supt., Mr. Powers.

Norfolk, Va.—Approval of resolution previously passed by Common Council to appropriate $10,000 for protection of city water supply was voted by Board of Aldermen.

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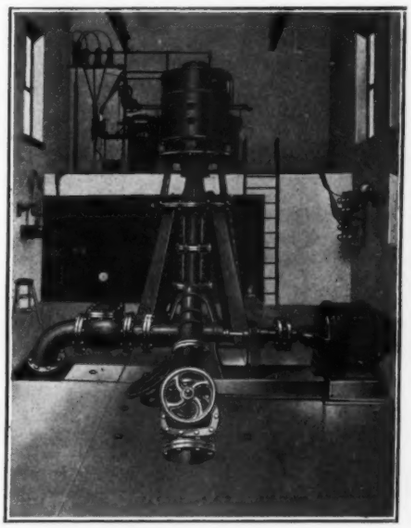

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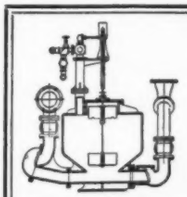
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